A REVISION OF THE INDIAN SPECIES OF *HAPLOTHRIPS* AND RELATED GENERA (THYSANOPTERA : PHLAEOTHRIPIDAE)

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CONTENTS

SYNOPSIS

Sixty nominal species and two nominal varieties of *Haplothrips* and related genera are discussed. Of these, two species are described as new. The Indian records of three species are refuted. One new generic synonymy, 11 new specific synonymies, and 10 new combinations are established. A key for the identification of the 48 species recorded from India is provided. The characteristic features of each genus and species, a brief discussion of any changes in nomenclature and a list of material examined are given. Lectotypes are designated for 11 species.

INTRODUCTION

There are about 4500 described species of Thysanoptera, although recent work on tropical faunas suggests that there may be more than double this number. Of these about 520 species are recorded from India (Ananthakrishnan, 1969). The Thysanoptera may be divided into two suborders, the Terebrantia and the Tubulifera. The latter comprises a single large family, the Phlaeothripidae, and includes about 2700 described species. Of these about 300 are recorded from India. The Phlaeothripidae may be further divided into two subfamilies, the Idolothripinae and the Phlaeothripinae. The Phlaeothripinae is by far the larger subfamily with about 2300 described species. Of these about 230 species are recorded from India. The Phlaeothripinae may be further subdivided into a number of tribes (Priesner, 1960; Mound, 1972), including the Haplothripini.

The tribe Haplothripini comprises a group of *Haplothrips*-like species with the following diagnostic features: antennae eight-segmented; wings usually present

and fully developed, sometimes reduced or absent, when fully developed with or without duplicated cilia; maxillary stylets usually long and retracted far into the head capsule; maxillary bridge usually present; male genitalia with a well developed aedeagus; usually without glandular areas on abdominal sternites. The tribe has a world-wide distribution and comprises more than 300 species. These are found in flowers, at the base of grasses, on dead leaves and branches and as inquilines of galls, but it should be stressed that none of them form galls or cause leaf-rolling as do many species of the tribe Haplothripini. A total of 87 species in 14 genera are recognized from India.

The initial object of this study was to find stable diagnostic characters by which Indian species assigned to the haplothripine genera *Haplothrips* Amyot & Serville and *Xylaplothrips* Priesner could be recognized. Some of these species, however, are more closely related to species in other genera. The study was therefore extended to cover all Indian species listed by Ananthakrishnan (1969) in *Apterygothrips* Priesner, *Chiraplothrips* Priesner, *Haplothrips* Amyot & Serville, *Karnyothrips* Watson, *Praepodothrips* Priesner & Seshadri, *Xenothrips* Ananthakrishnan (**syn. n.** of *Antillothrips* Stannard) and *Xylaplothrips* Priesner, and any species described subsequently from India in these genera. This group includes 45 described species and two new species. The haplothripine genera not included in this account but represented in India, with the exception of *Podothrips* Hood and the monobasic genus *Segnothrips* Ananthakrishnan, may be readily distinguished from *Haplothrips* and related genera using the key characters given by Ananthakrishnan (1969). Species of *Podothrips* may be distinguished from other haplothripines by their praepectal plates, which are longer than broad. *Segnothrips trivandrensis* Ananthakrishnan is being synonymized elsewhere with a species of *Haplothrips* by Dr J. S. Bhatti (pers. comm.).

Six of the seven genera discussed in this account cannot be readily distinguished from each other due to the occurrence of intermediates. Each of these genera, however, exhibits distinct trends and it is on these trends that the generic classification used here is based.

In view of the existence of intermediate species, a workable key to genera would be extremely complex and consequently difficult to use. I have therefore written the key in its present form, rather than as a key to genera followed by keys to the species of each genus. The characters used to distinguish species in different genera are not necessarily significant at the generic level. The characteristics of each genus are discussed separately in the text.

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ABBREVIATIONS

The following abbreviations have been used in the text.

BMNH	British Museum (Natural History), London
LCM	Loyola College, Madras
SMF	Senckenberg Museum, Frankfurt
USNM	United States National Museum, Washington D.C.
TNA	Professor T. N. Ananthakrishnan

INDIAN RECORDS REFUTED

The Indian records of *Apterygothrips flavus* Faure, *Haplothrips flavitibia* Williams and *Xylaplothrips mimus* Priesner are refuted for the reasons given below. The Indian records (Ananthakrishnan, 1969) of *Apterygothrips hispanicus* (Bagnall), *Haplothrips andresi* Priesner and *Haplothrips bagnalli* (Trybom), which are accepted here, require confirmation.

Apterygothrips flavus Faure

Apterygothrips flavus Faure, 1940 : 163. Holotype ♀ aptera, SOUTH AFRICA: Cape Province, Middelburg (National Insect Collection, Pretoria) [not examined].
Apterygothrips flavus Faure; zur Strassen, 1966 : 161–175.

Faure (1940) described *flavus* from nine apterous females and six apterous males collected on *Cenchrus ciliaris* L. [Gramineae] at Middelburg, Cape Province, South Africa. Ananthakrishnan (1967) recorded *flavus* as new to India. None of the specimens on which this Indian record is based represents *flavus*. They are being described elsewhere as a new species of *Apterygothrips* (Dr J. S. Bhatti, pers. comm.).

Haplothrips flavitibia Williams

Haplothrips flavitibia Williams, 1916 : 283–284. Holotype ♀, GREAT BRITAIN: England, Surrey, Merton (Albany Museum, Grahamstown) [examined].

Williams (1916) described *flavitibia* from six specimens, of unspecified sex, beaten from a hedge of hawthorn (*Crataegus oxyacanthoides* Thuillier [Rosaceae]) in Surrey, England in July, 1913 and July, 1914. Priesner (1964*a*) also records *flavitibia* from Germany.

Ananthakrishnan (1952) described a male from Madras collected on the flowers of *Portlandia grandiflora* L. [Rubiaceae] which he incorrectly designated as the holotype male of *flavitibia*. This specimen has the base of the mid and hind tibiae dark brown, whereas *flavitibia* has the mid and hind tibiae completely yellow. Unfortunately I have not examined this Indian male, but in view of the colour differences referred to above it is certainly not *flavitibia*. In the absence of any other published records, the Indian record of *flavitibia* is therefore refuted.

Specimen studied.

Holotype ♀, Great Britain: England, Surrey, Merton, on hawthorn (*Crataegus oxyacanthoides* Thuillier) [Rosaceae], vii. 1913 (*C. B. Williams*) (Albany Museum, Grahamstown).

Xylaplothrips mimus Priesner

Xylaplothrips mimus Priesner, 1939 : 172–174. Holotype ♀, Zaire: Rutshuru (SMF) [not examined].

Priesner (1939) described *mimus* from two females and one male collected on a coffee bush at Rutshuru, Congo (Kinshasa). These specimens apparently have 1 + 1 and 1 + 2 sense cones on antennal segments III and IV respectively. Ananthakrishnan (1966) recorded *mimus* as new to India. This record was based on four females and 11 males collected on grass at Hubli, 21.xi.1964 (*TNA*). I have examined two females collected on grass at Hubli, 17.xi.1964 (*TNA*) and identified by Professor Ananthakrishnan as *mimus*. These specimens, however, have 1 + 2 and 2 + 2^{+1} sense cones on antennal segments III and IV respectively and I cannot distinguish them from *pictipes* Bagnall.

CHECKLIST OF THE INDIAN SPECIES OF *HAPLOTHRIPS* AND RELATED GENERA

An asterisk denotes the designation of a lectotype.

Genus ***ANTILLOTHRIPS*** Stannard, 1957
Xenothrips Ananthakrishnan, 1965*b* **syn. n.**
graminellus (Ananthakrishnan & Jagadish, 1969) **comb. n.**
malabaricus (Ananthakrishnan, 1965*b*) **comb. n.**
luteus* (Ananthakrishnan & Kudo, 1974) **syn. n.
micropterus **sp. n.**
nayari (Ananthrakrishnan, 1958) **comb. n.**
varius (Ananthakrishnan & Jagadish, 1969) **comb. n.**
nefrens (Ananthakrishnan, 1972) **syn. n.**
Genus ***APTERYGOTHRIPS*** Priesner, 1933*a*
fungosus (Ananthakrishnan & Jagadish, 1969) **comb. n.**
hispanicus (Bagnall, 1916)
jogensis (Ananthakrishnan & Jagadish, 1969) **comb. n.**
pellucidus (Ananthakrishnan, 1968) **comb. n.**
pini Ananthakrishnan, 1961*a*
rubiginosus (Ananthakrishnan & Jagadish, 1971) **comb. n.**
Genus ***CHIRAPLOTHRIPS*** Priesner, 1930
graminellus (Priesner, 1938)
priesneri (Ananthakrishnan, 1961*b*)
Genus ***HAPLOTHRIPS*** Amyot & Serville, 1843
Subgenus ***HAPLOTHRIPS*** Amyot & Serville, 1843
andresi Priesner, 1928
bicolor (Ananthakrishnan, 1964*a*) **comb. n.**
ceylonicus Schmutz, 1913

ganglbaueri Schmutz, 1913
priesnerianus Bagnall, 1933 **syn. n.**
ceylonicus var. *vernoniae* Priesner, 1921 **syn. n.**
andhra Ramakrishna, 1928 **syn. n.**
gowdeyi (Franklin, 1908)
soror Schmutz, 1913 **syn. n.**
sororcula Schmutz, 1913 **syn. n.**
longisetosus Ananthakrishnan, 1955
pirus Bhatti, 1967
reuteri (Karny, 1907)
tenuipennis Bagnall, 1918
ceylonicus var. *mangiferae* Priesner, 1933*b*

Subgenus ***TRYBOMIELLA*** Bagnall, 1926
apicalis (Bagnall, 1915)
articulosus Bagnall, 1926
derisor Priesner, 1935
bagnalli (Trybom, 1910)
clarisetis Priesner, 1930
euphorbiae Priesner, 1931
nigricornis Bagnall, 1910
ramakrishnai Karny, 1926 **syn. n.**
talpa Priesner, 1930
tirumalraoi Ramakrishna & Margabandhu, 1931

Genus ***KARNYOTHRIPS*** Watson, 1922
alpha **sp. n.**
flavipes (Jones, 1912)
melaleucus (Bagnall, 1911)
mucidus (Ananthakrishnan & Jagadish, 1971) **comb. n.**
nigriflavus Ramakrishna, 1934

Genus ***PRAEPODOTHIRPS*** Priesner, 1928
cymbapogoni Ananthakrishnan, 1956
indicus Priesner & Seshadri, 1952
****nigrocephalus*** Ananthakrishnan, 1964
priesneri Ananthakrishnan, 1955

Genus ***XYLAPLOTHRIPS*** Priesner, 1928
debilis Ananthakrishnan & Jagadish, 1971
emineus Ananthakrishnan & Jagadish, 1971
****flavitibia*** Ananthakrishnan, 1969
flavus Ananthakrishnan, 1964*a*
****inquilinus*** (Priesner, 1921)
inquilinus Ananthakrishnan, 1966 **syn. n.**
longus* Ananthakrishnan & Jagadish, 1969 **syn. n.
orientalis* Ananthakrishnan & Jagadish, 1969 **syn. n.
ligs Ananthakrishnan & Jagadish, 1971
micans Ananthakrishnan & Jagadish, 1971
pictipes (Bagnall, 1919)
pusillus Ananthakrishnan & Jagadish, 1969
****tener*** Ananthakrishnan & Jagadish, 1969

KEY TO THE INDIAN SPECIES OF *HAPLOTHRIPS* AND RELATED GENERA

(excluding *longisetosus* Ananthakrishnan (p. 252))

1 Maxillary stylets short, when at rest not retracted far into the head capsule; maxillary bridge absent; praepectal plates weak or absent (cf. Text-figs 1–4) . . . 2
– Maxillary stylets longer, when at rest retracted far into the head capsule; maxillary bridge usually present; praepectal plates usually present and well developed (cf. Text-figs 9–15) 6
2 Body brown.
On dry twigs and *Areca* [Palmae] sheaths . . ***Antillothrips varius*** (p. 235)
– Body bicoloured, at least abdominal segment II yellow 3
3 Pronotal antero-marginal setae well developed and expanded apically (Text-fig. 4).
On bamboo . . . . . ***Antillothrips nayari*** (p. 235)
– Pronotal antero-marginal setae vestigial (cf. Text-figs 1, 2) 4
4 Pterothorax mainly yellow, light brown at anterior margin only; antennal segments III and IV each with 1 + 1 sense cones (Text-fig. 6); micropterous.
On bamboo . . . . . ***Antillothrips micropterus*** (p. 234)
– Pterothorax brown; antennal segments III and IV with 1+1 and 1 + 2^{+1} sense cones respectively; macropterous 5
5 Post-ocular and median setae (B_1) on abdominal tergite IX pointed; fore wings with 1–4 duplicated cilia. On bamboo and grass . ***Antillothrips malabaricus*** (p. 232)
– Post-ocular and median setae (B_1) on abdominal tergite IX expanded apically; fore wings with 5–7 duplicated cilia. On grass and bamboo
Antillothrips graminellus (p. 231)
6 Abdominal tergites III–VII without well developed wing-retaining setae (Text-fig. 16); wings usually reduced or absent 7
– Abdominal tergites III–VII with at least one pair, usually two pairs, of well developed wing-retaining setae (Text-figs 17, 18); wings usually fully developed . . . 11
7 Antennal segment IV with 2 + 2^{+1} sense cones 8
– Antennal segment IV with at most 1 + 2 sense cones 9
8 Antennal segment III with 1 + 1 sense cones (Text-fig. 25); pronotal mid-lateral setae vestigial (Text-fig. 13). On *Lantana* sp. [Verbenaceae] twigs
Apterygothrips rubiginosus (p. 243)
– Antennal segment III without sense cones (Text-fig. 23); pronotal mid-lateral setae well developed and expanded apically (Text-fig. 12). On dry twigs and fungus-infested branches of *Flacourtia* [Flacourtiaceae] . ***Apterygothrips jogensis*** (p. 239)
9 Body mainly brown; post-ocular setae pointed.
Tube yellow with brown apex; antennal segment IV with 1 + 1 sense cones. On pine and dry twigs . . . . . ***Apterygothrips pini*** (p. 241)
– Body mainly yellow; post-ocular setae expanded apically 10
10 Tube brown; antennal segments III and IV with 1 + 1 and 1+ 1^{+1} sense cones respectively; pronotal antero-marginal setae well developed and expanded apically; median setae (B_1) on abdominal tergite IX pointed. Macropterous or apterous. On decaying twigs . . . ***Apterygothrips fungosus*** (p. 237)
– Tube mainly yellow, extreme apex tinged with brown; antennal segments III and IV with 0 + 1 and 1 + 2 sense cones respectively; pronotal antero-marginal setae vestigial; median setae (B_1) on abdominal tergite IX expanded apically. Apterous. On *Sorghum* [Gramineae] and grass . ***Apterygothrips pellucidus*** (p. 241)
11 Abdominal tergites III–VII with one pair of well developed wing-retaining setae (Text-fig. 17).
Bicoloured species. On *Cynodon* [Gramineae] and other grasses
Haplothrips apicalis (p. 255)
– Abdominal tergites III–VII with two pairs of well developed wing-retaining setae . 12

12 Antennal segment IV with 2 + 2 or more usually 2 + 2^{+1} sense cones (cf. Text-figs 34, 36) 13
– Antennal segment IV with at most 1 + 2^{+1} sense cones (cf. Text-figs 30–33) . . 37
13 Forewings without duplicated cilia 14
– Forewings with duplicated cilia 20
14 Antennal segment III with 0 + 1 sense cone 15
– Antennal segment III with 1 + 1 sense cones 16
15 Post-ocular setae short and pointed. In grass flowers . . ***Haplothrips talpa*** (p. 260)
– Post-ocular setae blunt. On *Colocasia* [Araceae] . ***Haplothrips tirumalraoi*** (p. 260)
16 Pronotal antero-marginal setae well developed (cf. Text-fig. 43) 17
– Pronotal antero-marginal setae vestigial 18
17 Pronotal mid-lateral setae well developed (Text-fig. 43). In flowers ***Haplothrips articulosus*** (p. 257)
– Pronotal mid-lateral setae vestigial (cf. Faure, 1955 : fig. 8). In flowers ***Haplothrips clarisetis*** (p. 258)
18 Post-ocular setae minute; pronotal epimeral setae greatly expanded (Text-fig. 44); median setae (B_1) on abdominal tergite IX expanded apically. On *Euphorbia* [Euphorbiaceae] . . . ***Haplothrips euphorbiae*** (p. 259)
– Post-ocular setae well developed and expanded apically; epimeral setae not greatly expanded; median setae (B_1) on abdominal tergite IX pointed or blunt . . 19
19 Pronotal antero-angular and postero-angular setae fairly well developed (cf. Faure, 1955 : fig. 4). In flowers . . . . . ***Haplothrips bagnalli*** (p. 258)
– Pronotal antero-angular and postero-angular setae vestigial (cf. Faure, 1955 : fig. 1). In flowers . . . . . ***Haplothrips nigricornis*** (p. 259)
20 Pronotal antero-marginal setae well developed 21
– Pronotal antero-marginal setae vestigial 35
21 Antennal segment III with 0 + 1 sense cones 22
– Antennal segment III with 1 + 1 or 1 + 2 sense cones 25
22 Post-ocular setae pointed or blunt (Text-fig. 40). In flowers ***Haplothrips andresi*** (p. 244)
– Post-ocular setae expanded apically 23
23 Mid- and hind-tibiae brown with yellow apices. In flowers ***Haplothrips ceylonicus*** (p. 248)
– Mid and hind tibiae brown 24
24 Aedeagus of male bifid at apex (cf. Bhatti, 1973 : fig 3). In flowers of wheat ***Haplothrips bagrolis*** (p. 245)
– Aedeagus of male simple. In flowers of Gramineae ***Haplothrips ganglbaueri*** (p. 249)
25 Antennal segment III 1 + 1 sense cones 26
– Antennal segment III with 1 + 2 sense cones 30
26 Body bicoloured, abdominal segments III–VII yellow with small median, pale brown patches. In psyllid galls . . . . . ***Haplothrips bicolor*** (p. 248)
– Body brown or almost entirely yellow 27
27 Body yellow except apex of tube. In leaf mines on *Syzygium* [Myrtaceae] . . . ***Haplothrips pirus*** (p. 253)
– Body brown 28
28 Post-ocular and pronotal epimeral setae pointed (Text-fig. 40). In flowers . . . . . ***Haplothrips reuteri*** (p. 253)
– Post-ocular and pronotal epimeral setae expanded apically (cf. Text-fig. 39) . . 29
29 Mid and hind tibiae and tarsi brown. In flowers . ***Haplothrips gowdeyi*** (p. 250)
– Mid and hind tibiae yellow at apex, all tarsi yellow. In flowers ***Haplothrips tenuipennis*** (p. 254)
30 Head brown, pronotum yellow. On dry twigs . . . . . ***Xylaplothrips emineus*** (p. 269)

– Head and pronotum brown 31
31 Abdominal segments III–IX distinctly paler than head, grey-yellow with median transverse brown patches. On fungus-infested *Areca* [Palmae] sheaths and dry *Smilax* [Liliaceae] twigs . . . . . ***Xylaplothrips pusillus*** (p. 274)
– Abdominal segments III–IX brown, not distinctly paler than head . . . 32
32 Hind tibiae dark brown except at base.
On bamboo . . . . . ***Praepodothrips priesneri*** (p. 268)
– Hind tibiae yellow to brown but never brown at apex 33
33 Antennal segments IV and V yellow at base, pale brown at apex.
In palm inflorescences . . . . . ***Xylaplothrips flavus*** (p. 270)
– Antennal segments IV and V brown 34
34 Fore tarsi unarmed. On try twigs . . . . . ***Xylaplothrips tener*** (p. 276)
– Fore tarsi with small claws. On dry berries and grass ***Xylaplothrips pictipes*** (p. 274)
35 Antennal segment III with 1 + 1 sense cones. Body mainly yellow.
On dry and decaying twigs and bark . . . ***Xylaplothrips micans*** (p. 273)
– Antennal segment III with 1 + 2 sense cones. Body mainly brown . . . 36
36 Hind tibiae yellow. In galls . . . . . ***Xylaplothrips flavitibia*** (p. 270)
– Hind tibiae tinged with brown. In galls . . ***Xylaplothrips inquilinus*** (p. 272)
27 Pronotal antero-marginal setae well developed and expanded apically . . . 38
– Pronotal antero-marginal setae vestigial or pointed 40
38 Antennal segment III with 0 + 1 sense cone (Text-fig. 58).
On dry twigs . . . . . ***Xylaplothrips ligs*** (p. 273)
– Antennal segment III with 1 + 1 sense cones 39
39 Head and pronotum yellow-brown, distinctly paler than antennal segments IV–VIII.
On decaying twigs . . . . . ***Apterygothrips fungosus*** (p. 237)
– Head and pronotum brown, concolourous with or slightly darker than antennal segments IV–VIII. On dry twigs . . . ***Xylaplothrips debilis*** (p. 268)
40 Antennal segment IV with 1 + 1^{+1}, 1 + 2, or 1 + 2^{+1} sense cones; post-ocular setae pointed or blunt 41
– Antennal segment IV with 1 + 1^{+1}, 1 + 2, or 1 + 2^{+1} sense cones; post-ocular setae expanded apically 45
41 Head relatively large; cheeks convex; head distinctly narrower across base . . 42
– Head not unusually large; cheeks more or less parallel; head not noticeably narrower across base 44
42 Body brown.
Antennal segment III with 1 + 1 sense cones (Text-fig. 46); fore wings with 5–7 duplicated cilia. On *Cymbopogon* [Gramineae] and other grasses
Praepodothrips cymbapogoni (p. 265)
– Body bicoloured 43
43 Thorax brown. Antennal segment III with 1 + 1 sense cones (Text-fig. 49); fore wings with 4–8 duplicated cilia. On grass . . ***Praepodothrips indicus*** (p. 267)
– Thorax yellow. Antennal segment III with 0 + 1 sense cones (Text-fig. 51); fore wings without duplicated cilia. On grass ***Praepodothrips nigrocephalus*** (p. 267)
44 Antennal segment III with 0 + 1 sense cones; antennal segments III–VI and fore legs short and stout; pronotal epimeral setae pointed. On grass
Chiraplothrips graminellus (p. 243
– Antennal segment III with 1 + 1 sense cones; antennal segment III–VI and fore legs slender; pronotal epimeral setae slightly expanded apically. On grass
Apterygothrips hispanicus (p. 239
45 Body brown.
Antennal segments III and IV with 1 + 1 and 1 + 2^{+1} sense cones respectively; fore wings with 1–5 duplicated cilia. On numerous plants, predatory on scales, whitefly and mites . . . . . ***Karnyothrips flavipes*** (p. 262)
– Body bicoloured 46

46 Prothorax yellow; fore wings without duplicated cilia.
Antennal segments III and IV with 0 + 1 and 1 + 2 sense cones respectively; median setae (B_1) on abdominal tergite IX pointed. On bamboo, sugarcane and grass . . . . . ***Karnyothrips alpha*** (p. 261)
– Prothorax brown; at least one duplicated cilium on one of the fore wings . . 47
47 Pterothorax yellow.
Antennal segments III and IV with 0 + 1 and 1 + 2 sense cones respectively; median setae (B_1) on abdominal tergite IX expanded apically. On bamboo and grass . . . . . ***Karnyothrips nigriflavus*** (p. 264)
– Pterothroax brown 48
48 Antennal segments III and IV with 1 + 1 and 1 + 1^{+1} sense cones respectively (Text-fig. 30); median setae (B_1) on abdominal tergite IX pointed or blunt. On numerous plants, probably predatory . . ***Karnyothrips melaleucus*** (p. 263)
– Antennal segments III and IV with 0 + 1 and 1 + 2^{+1} sense cones respectively; median setae (B_1) on abdominal tergite IX expanded apically. On dry twigs ***Karnyothrips mucidus*** (p. 264)

GENERA AND SPECIES DISCUSSED ALPHABETICALLY

ANTILLOTHRIPS Stannard

Antillothrips Stannard, 1957 : 35–36. Type-species: *Antillothrips graminatus* Stannard [= *Zygothrips cingulatus* Hood], by original designation.
Xenothrips Ananthakrishnan, 1965*a* : 53. Type-species: *Xenothrips malabaricus* Ananthakrishnan, by original designation. **Syn. n.**

The genus *Antillothrips* was erected by Stannard (1957) for *graminatus*, which was subsequently synonymised with *Zygothrips cingulatus* Hood (Pitkin, 1973). This species is a widespread, tropical, grass-living thrips recorded from Australia, Solomon Is., New Britain, U.S.A. (Florida), Jamaica and Trinidad. I have recently collected a single female of this bicoloured species in Tanzania.

The monotypic genus *Xenothrips* was erected by Ananthakrishnan (1965) for the Indian species *malabaricus*, here transferred to *Antillothrips*. A further three Indian species formerly assigned to *Xylaplothrips* are also transferred here to *Antillothrips* and one new species is described. Four of the five Indian species recognized here are bicoloured and are associated with grasses.

Generic definition. Small to medium sized, bicoloured or brown species of Haplothripini. Maxillary stylets short, when at rest not retracted far into the head capsule; maxillary bridge absent; post-ocular setae pointed to expanded. Antennal segment III with 0 + 1 or 1 + 1 sense cones; segment IV with 1 + 2^{+1} or 1 + 1 sense cones. Pronotal antero-marginal and mid-lateral setae well developed or vestigial; praepectal plates weakly developed or absent. Wings usually fully developed and either with or without duplicated cilia on fore wings; more rarely reduced. Abdominal tergites III–VII usually with two pairs of well developed wing-retaining setae.

Antillothrips graminellus (Ananthakrishnan & Jagadish) **comb. n.**

(Text-figs 1, 5)

Xylaplothrips graminellus Ananthakrishnan & Jagadish, 1969 : 123–124. Syntypes 5 ♀, 2 ♂ India: Tirupathi (LCM) [3 ♀ examined].

Bicoloured species; head, thorax, abdominal segments VIII–X brown; antennal segments I and II pale brown, segments IV–VI pale brown in apical half to two-thirds, segments VII and VIII brown; remainder yellow.

Antennal segments III and IV with 1 + 1 and 1 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and expanded apically; macropterous, fore wings with 5–7 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

This species was described from five females and two males collected at Tirupathi on grass. No holotype was designated in the original description although the three syntype females examined are labelled as paratypes. The additional female examined, from Tumkur on bamboo, had been incorrectly labelled as a male of *Xylaplothrips nayari*.

Specimens studied.

Syntypes 3 ♀, India: Tirupathi, on grass, 6.xi.1694 (*TNA*) (LCM).
India: Tumkur, 1 ♀ on bamboo, 5.ix.1967 (*TNA*) (BMNH).

Antillothrips malabaricus (Ananthakrishnan) **comb. n.**

Xenothrips malabaricus Ananthakrishnan, 1965*b* : 53–54. LECTOTYPE ♀, India: Chalakudi (Kerala) (LCM), here designated [examined].

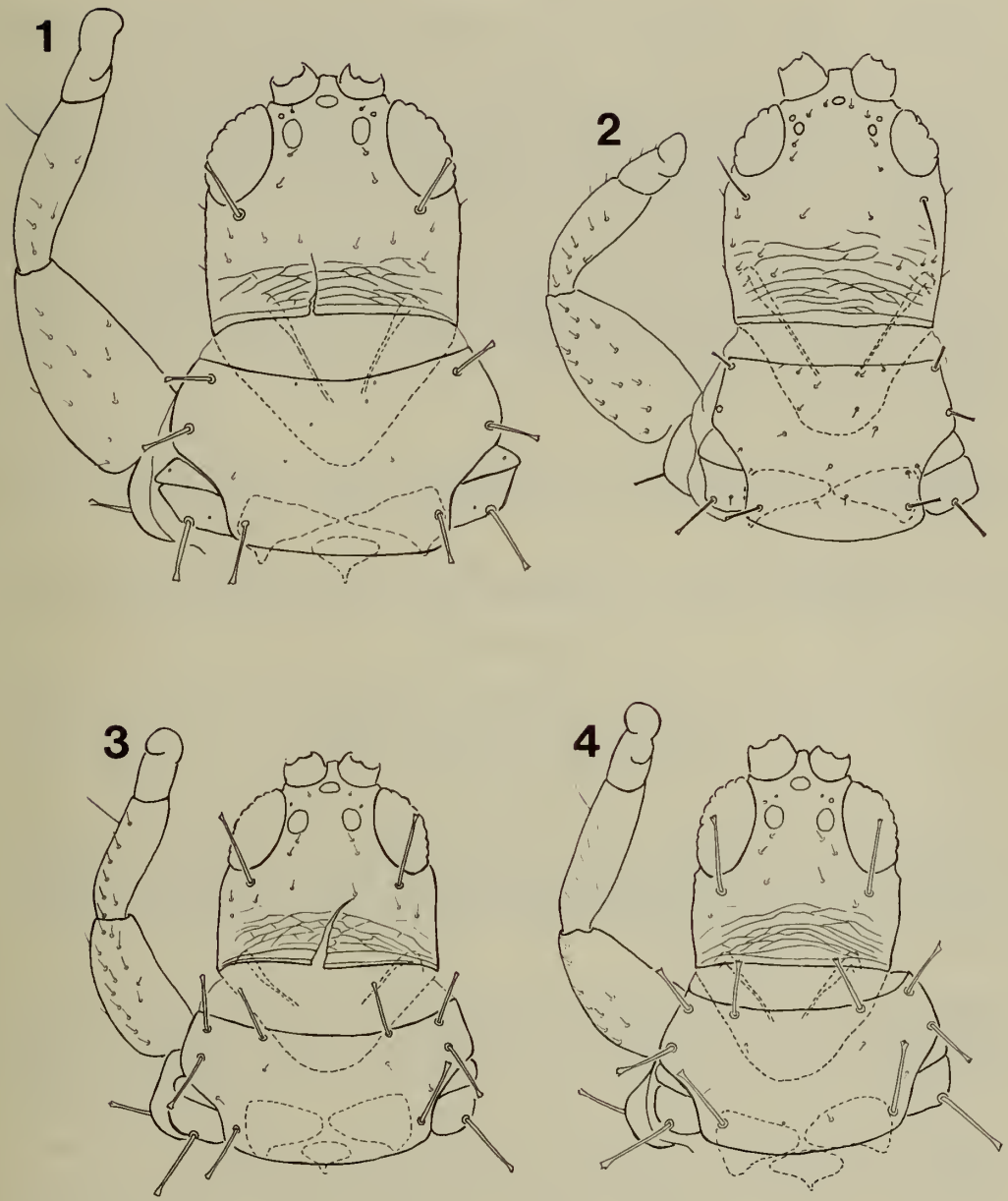
Xenothrips luteus Ananthakrishnan & Kudo, 1974 : 119–120. LECTOTYPE ♀, India: Palghat (LCM), here designated [examined]. **Syn. n.**

Bicoloured species; head, thorax, abdominal segments VII or VIII–X brown; antennal segments I and II yellow tinged with brown, particularly at margins; antennal segment VI brown in distal half; antennal segments VII and VIII brown; outer basal portion of fore femora, particularly of male, brown; remainder yellow.

Antennal segments III and IV with 1 + 1 and 1 + 2^{+1} sense cones respectively; post-ocular setae pointed; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and expanded apically; macropterous, fore wings with 1–4 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from '2 macropterous, 4 brachypterous females and 2 brachypterous males' (Ananthakrishnan, 1965*b*) and not 'only apterous males and females' (Ananthakrishnan, 1968). No holotype was designated in the original description and unfortunately the four syntypes that I have examined represent two distinct congeneric species. Moreover one female, labelled 'HOLOTYPE', and one male, labelled 'Paratype', are macropterous and one female, labelled 'PARATYPE', and one male, labelled 'ALLOTYPE', are micropterous. The macropterous female labelled 'HOLOTYPE' is here designated as the lectotype of *malabaricus*. The macropterous male labelled 'Paratype' is regarded as a paralectotype of *malabaricus*. The micropterous female labelled 'PARATYPE' and the micropterous male labelled 'ALLOTYPE' are described below as a new species of *Antillothrips*. The identity of the remaining four syntypes, which I have not examined, remains in doubt.

Contrary to the original description the lectotype female has one duplicated cilium on each fore wing. The male paralectotype has one duplicated cilium on the right fore wing and two on the left fore wing. Three other specimens from



FIGS 1–4. *Antillothrips* species: heads, pronota and left forelegs. 1, *graminellus*, paratype ♀. 2, *micropterus*, holotype ♀. 3, *varius*, ♀. 4, *nayari*, ♀.

Coimbatore that I have examined have up to four duplicated cilia on the fore wing. All of these specimens have a brown, not yellow, prothorax and abdominal segment IX.

Xenothrips luteus (Ananthakrishnan & Kudo, 1974) was described from two females from Palghat on grass, 17.ii.1967 and one male from Chalakudi on dry grass, 5.xii.1963. No holotype was designated in the original description. One of the two female syntypes has been examined and this is labelled 'HOLOTYPE'. This specimen is here designated as the lectotype of *luteus*. The above synonymy is based on comparison of this specimen with the lectotype and paralectotype of *malabaricus*.

Ananthakrishnan & Kudo (1974) described a subspecies of *luteus* from Thailand which they called *exastis*. I have examined a syntype of this subspecies labelled 'HOLOTYPE' and it is my opinion that this represents a distinct species. The status of *exastis* will be dealt with elsewhere, since it lies beyond the scope of this paper.

Specimens studied.

Lectotype ♀, paralectotype ♂ of *malabaricus*, India: Chalakudi (Kerala) on bamboo, 5.xii.1965 (*TNA*) (LCM). Lectotype ♀ of *luteus*, India: Palghat, grass, 17.xi.1967 (*TNA*) (LCM).

India: Coimbatore, 2 ♀, 1 ♂ on grass stumps, 24.vi.1973 (*J. S. Bhatti*) (Hans Raj College, Delhi).

Antillothrips micropterus sp. n.

(Text-figs 2, 6)

This species is described from a micropterous female and male originally misidentified and described as syntypes of *malabaricus* (cf. p. 232). It may be readily distinguished from the latter by the mainly yellow pterothorax and from all species of *Antillothrips* by the short wings and presence of only 1 + 1 sense cones on antennal segment IV.

Bicoloured species of *Antillothrips*; head, pronotum and distal half of tube brown; pterothorax mainly yellow, anterior margin tinged with brown; abdominal segments II–IX and basal half of tube yellow; fore femora brown except at apex; fore tibiae and tarsi yellow; mid and hind legs yellow.

Antennal segments III and IV each with 1 + 1 sense cones; post-ocular setae pointed; pronotal antero-marginal setae vestigial; mid-lateral setae well developed and expanded apically; micropterous; median setae (B_1) on abdominal tergite IX pointed.

Measurements in μm of holotype female (paratype male): total length 1360 (950, contracted); head length 171 (153); pronotal length 114 (108); tube length 87 (72); tube width at base 51 (45).

Holotype ♀ microptera, India: Chalakudi, on bamboo, 5.xii.1963 (*TNA*) (LCM). Paratype. India: 1 ♂ microptera, same date as holotype (LCM).

Antillothrips nayari (Ananthakrishnan) **comb. n.**

(Text-figs 4, 7)

Xylaplothrips nayari Ananthakrishnan, 1958 : 278–280. Holotype ♀, INDIA: Trivandrum (LCM) [not examined].

Bicoloured species; head, antennae (except segment III), thorax, and tube brown; abdominal segments III–IX pale brown to yellow brown, segments III–V of female darker then segments VI–IX; femora and tibiae yellow tinged with brown; pelta and abdominal segment II yellow.

Antennal segments III and IV with 1 + 1 and 1 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 3–6 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

This species was described from a holotype, an allotype and 'numerous males and females' from Trivandrum on bamboo leaf sheaths, ii. 1957 (*K. K. Naya*). I have not seen any of these specimens. The above diagnosis is based on the original description and six females and six males identified by Professor Ananthakrishnan.

SPECIMENS STUDIED.

INDIA: Thalachira, 6 ♀, 6 ♂ on bamboo sheath, 2.ix.1966 (*TNA*) (USNM; BMNH).

Antillothrips varius (Ananthakrishnan & Jagadish) **comb. n.**

(Text-figs 3, 8)

Xylaplothrips varius Ananthakrishnan & Jagadish, 1969 : 132. LECTOTYPE ♀, INDIA: Adur, Kerala (LCM), here designated [examined].

Xylaplothrips nefrens Ananthakrishnan, 1972 : 442–443. Holotype ♀, INDIA: U.P. Dehra Dun (LCM) [examined]. **Syn. n.**

Brown species with antennal segment III, apex of fore femora, and base and apex of tibiae yellow.

Antennal segments III and IV with 1 + 1 and 1 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 3–5 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

Antillothrips varius was originally described from three females and one male collected on *Areca* sheaths at Adur, India. No holotype was designated although one female syntype is labelled 'HOLOTYPE' and at least one other female syntype is labelled 'PARATYPE'. The male syntype is labelled 'ALLOTYPE'. The female labelled 'HOLOTYPE' is here designated as the lectotype of *varius*.

Antillothrips nefrens was originally described from 17 females, including the holotype, and five males collected on dry twigs at Dehra Dun, India. Ananthakrishnan (1973) distinguished *varius* and *nefrens* on whether both setae B_1 and B_2 on abdominal tergite IX were pointed or not. All of the type-material of both species that I have examined has setae B_1 expanded apically and setae B_2 pointed or blunt. I therefore regard *nefrens* as a synonym of *varius*.

FIGS 5–8. *Antillothrips* species: antennae. 5, *graminellus*, paratype ♀. 6, *micropterus*, holotype ♀. 7, *nayari*, ♀. 8, *varius*, ♀.

Specimens studied.

Lectotype ♀, paralectotypes 1 ♀, 1 ♂ of *varius*, India: Adur, Kerala on *Areca* [Palmae] sheaths, 28.vi.1967 (*TNA*) (LCM). Holotype ♀, paratypes 2 ♀, 2 ♂ of *nefrens*, India: U.P. Dehra Dun, on dry twigs, 12.x.1971 (*TNA*) (LCM; USNM).

APTERYGOTHRIPS Priesner

Apterygothrips Priesner, 1933*a* : 1. Type-species: *Apterygothrips haloxyli* Priesner, by original designation.

Zur Strassen (1966) recognized eight species of *Apterygothrips* and provided a key for their identification. Of these, five occur in the Mediterranean region, one in southern Africa, one in southern India, and one apparently in the Mediterranean region and India (cf. p. 239). A further species has been described more recently from Australia (Pitkin, 1973). Four Indian species formerly assigned to *Xylaplothrips* are here transferred to *Apterygothrips*. A total of six species are recognized here from India, although the Indian record of *hispanicus* (Bagnall) requires confirmation. Species of *Apterygothrips* are associated with grasses and dead wood.

Generic definition. Small to medium sized yellow, brown or bicoloured Haplothripini. Maxillary stylets long, when at rest retracted far into the head capsule, maxillary bridge usually present; ocelli sometimes reduced or absent; post ocular setae pointed or expanded apically. Antennal segment III with at most 1 + 1 sense cones. Pronotal antero marginal and mid lateral setae well developed or vestigial. Usually apterous and without well developed wing-retaining setae on abdominal tergites III–VII, sometimes macropterous and with two pairs of well developed wing-retaining setae on each of abdominal tergites III–VII; fore wings, if fully developed, with or without duplicated cilia.

Apterygothrips fungosus (Ananthakrishnan & Jagadish) **comb. n.**

(Text-fig. 19)

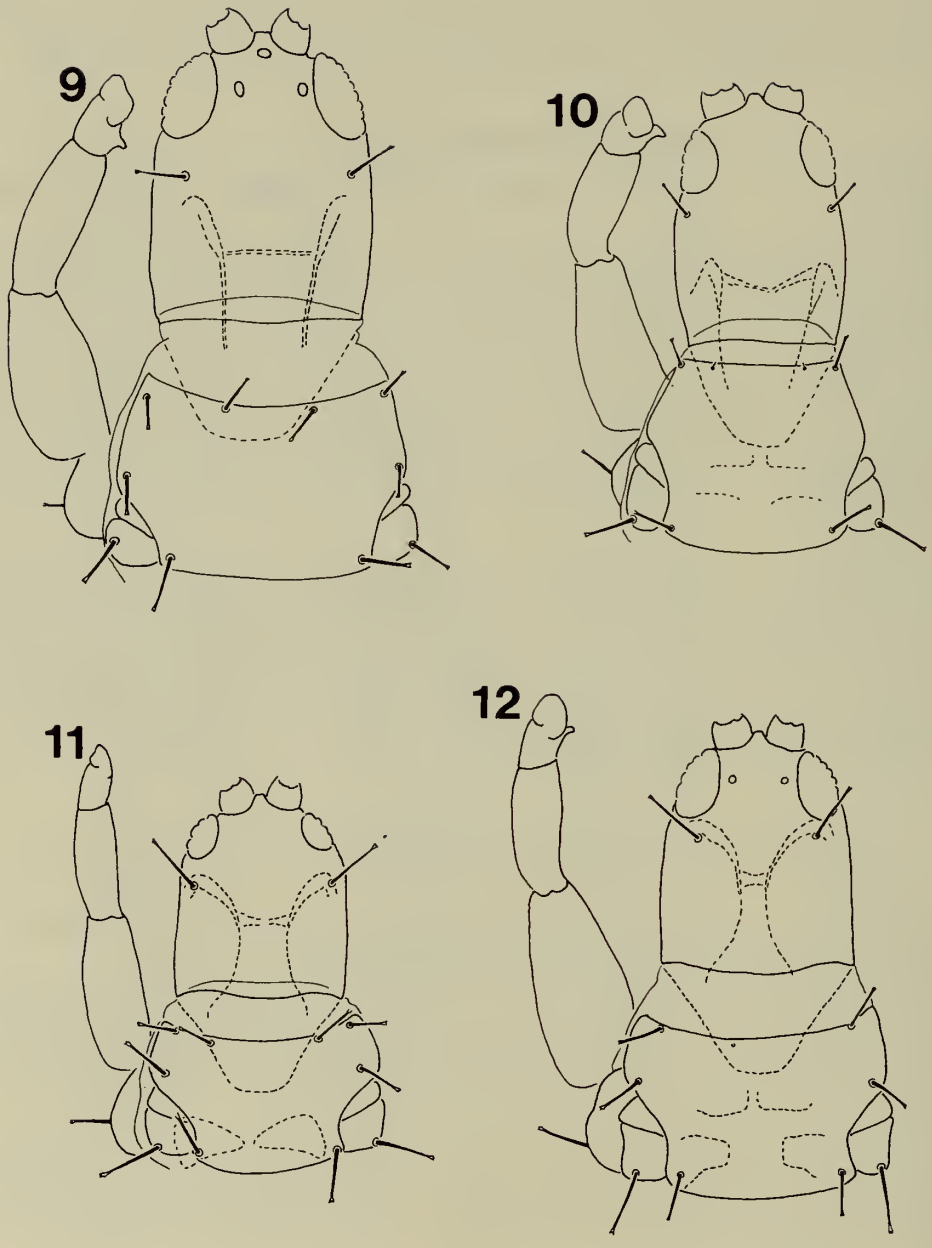
Xylaplothrips fungosus Ananthakrishnan & Jagadish, 1969 : 132–133. LECTOTYPE ♀ macroptera, India: Madras (LCM), here designated [examined].

Yellow-brown species with antennal segment IV–VIII and tube except base distinctly brown. Antennal segments III and IV with 1 + 1 and 1 + 1^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; apterous or macropterous, fore wings when fully developed with 1–5 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from a total of six females and six males. None of these specimens was designated as the holotype although one of the female syntypes examined is labelled 'HOLOTYPE'. This specimen, contrary to the original description, is macropterous and is here designated as the lectotype.

Specimens studied.

Lectotype ♀ macroptera, paralectotypes 2 ♀ apterae, India: Madras, decaying twigs, 25.vii.1967 (*TNA*) (LCM; USNM).



FIGS 9–12. *Apterygothrips* and *Haplothrips* species: heads, pronota and left forelegs. 9, *H. apicalis*, lectotype ♀. 10, *A. flavus*, paratype ♀ (African specimen). 11, *A. fungosus*, paratype ♀. 12, *A. jogensis*, ♀.

Apterygothrips hispanicus Bagnall

Cephalothrips hispanicus Bagnall, 1916 : 409–411. Holotype ♀, SPAIN: Zaragosa (BMNH) [examined].
Malacothrips hispanicus (Bagnall) Bagnall, 1924 : 635.
Apterygothrips hispanicus (Bagnall) Priesner, 1961 : 56.

Brown species; antennal segment III yellow; antennal segments IV–VI yellow tinged with brown; antennal segments VII and VIII pale brown; all femora brown; all tibiae brown at base becoming pale yellow at apex.

Antennal segments III and IV each with 1 + 1 sense cones; post-ocular setae pointed; pronotal antero-marginal setae moderately well developed and pointed; mid-lateral setae well developed and blunt to expanded; macropterous, wings often broken; fore wings without duplicated cilia (zur Strassen, 1966); median setae (B_1) on abdominal tergite IX pointed.

Bagnall (1923) recorded a single male of *hispanicus* from the flower of *Rhododendron* at Kulhara, Garhwal. The references by Bagnall (1924), Priesner (1928) and Ananthakrishnan (1969) of *hispanicus* from India appear to refer to this specimen. As far as I am aware no other published records of *hispanicus* in India exist. Since it is possible that Bagnall accidentally mis-labelled his specimen, the Indian record of *hispanicus* requires confirmation.

SPECIMENS STUDIED.

Holotype ♀, paratype ♀, SPAIN: Zaragosa, 8.iv.1913 (*Navás*) (BMNH).
?INDIA: Kulhara, Garwal, 11,700 ft, 1 ♂ on flower of *Rhododendron*, 5.vii.1970 (*A. D. Imms*) (BMNH).

Apterygothrips jogensis (Ananthakrishnan & Jagadish) **comb. n.**

(Text-figs 12, 23)

Xylaplothrips jogensis Ananthakrishnan & Jagadish, 1969 : 124–125. LECTOTYPE ♀ aptera, INDIA: Jog Falls (LCM), here designated [examined].

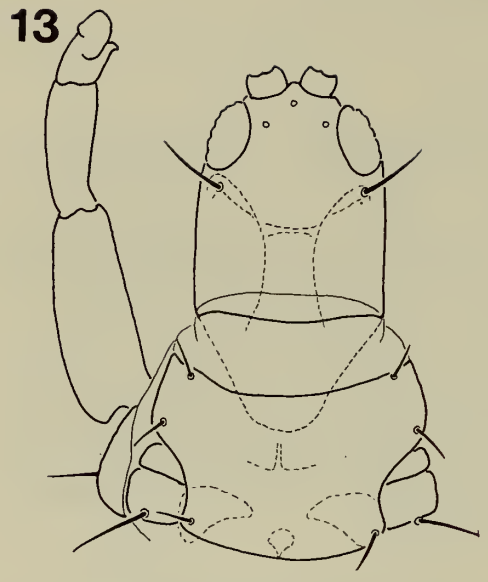
Brown species with apex of tibiae and tarsi yellow; antennal segment III yellow at base darkening towards apex to pale brown.

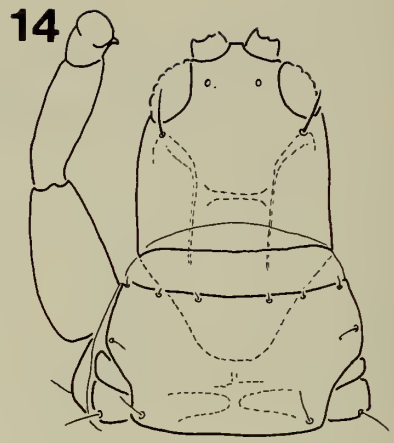
Antennal segments III and IV with 0 + 0 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial; mid-lateral setae well developed and expanded apically; apterous; median setae (B_1) on abdominal tergite IX pointed or blunt.

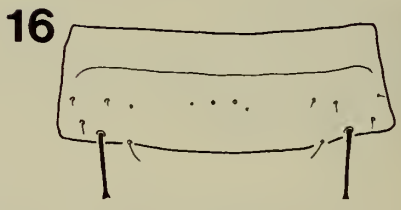
This species was originally described from four females and two males collected from fungus infested branches of *Flacourtia* sp. [Flacourtiaceae] at Jog Falls, India. None of these specimens was designated as the holotype. The two females and one male that I have examined are labelled 'HOLOTYPE', 'PARATYPE', and 'ALLOTYPE' respectively. The female labelled as the holotype is here designated lectotype.

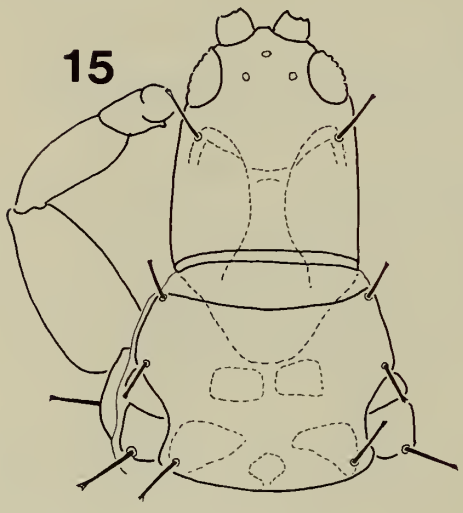
SPECIMENS STUDIED.

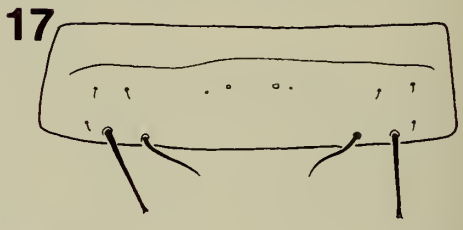
Lectotype ♀ aptera, paralectotypes 1 ♀ aptera, 1 ♂ aptera, INDIA: Jog Falls, on fungus infested branches of *Flacourtia* sp., 22.x.1966 (*TNA*) (LCM; USNM).

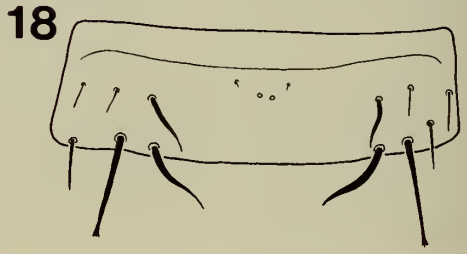












FIGS 13–18. 13–15. *Apterygothrips* species: heads, pronota and left forelegs of (13) *rubiginosus*, ♀; (14) *pini*, ♀; (15) *pelludicus*, paratype ♀. 16–18, abdominal tergite IV of (16) *Apterygothrips pellucidus* paratype ♂; (17) *Haplothrips apicalis*, ♀; 18, *H. ganglbaueri* (paralectotype ♀ of *priesnerianus*).

Apterygothrips pellucidus (Ananthakrishnan) **comb. n.**

(Text-figs 15, 16, 21)

Xylaplothrips pellucidus Ananthakrishnan, 1968 : 133. Holotype ♀ aptera, India: Madras (LCM) [not examined].

Mainly yellow species with antennal segments V–VIII brown; mesonotum and extreme apex of tube tinged with brown.

Antennal segments III and IV with 0 + 1 and 1 + 2 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and expanded apically; apterous; median setae (B_1) on abdominal tergite IX expanded apically.

This species was originally described from a holotype female, an allotype male, and 27 female and 17 male paratypes which are all apparently apterous. The specimens examined from Kalahasti, India and Taimergarha, Pakistan had been misidentified as *flavus* Faure.

Specimens studied.

Paratypes 1 ♀ aptera, 1 ♂ aptera, India: Madras, on *Sorghum* [Gramineae] leaves, 12.xi.1965 (*TNA*) (USNM).

?Paratypes 2 ♂ aptera, India: Madras, on *Sorghum* leaves, 12.xi.1965 (*TNA*) (BMNH).

India: Madras, 1 ♀ aptera on grass, 6.vii.1966 (*TNA*) (BMNH); Kalahasti, 1 ♀ aptera on grass, 9.ix.1964 (*TNA*) (BMNH). Pakistan: Taimergarha, 1 ♂ aptera on *Cynodon dactylon* (L.) Persoon [Gramineae] 30.i.1964 (*CIBC*) (BMNH).

Apterygothrips pini Ananthakrishnan

(Text-figs 14, 22)

Apterygothrips pini Ananthakrishnan, 1961*a* : 574–575. Holotype ♀ aptera, India: Kodaikanal, Bryant's Park (LCM) [examined].

Apterygothrips pini Ananthakrishnan; zur Strassen, 1966 : 161–175.

Pale brown species with bicoloured tube and antennal segment III paler than other segments.

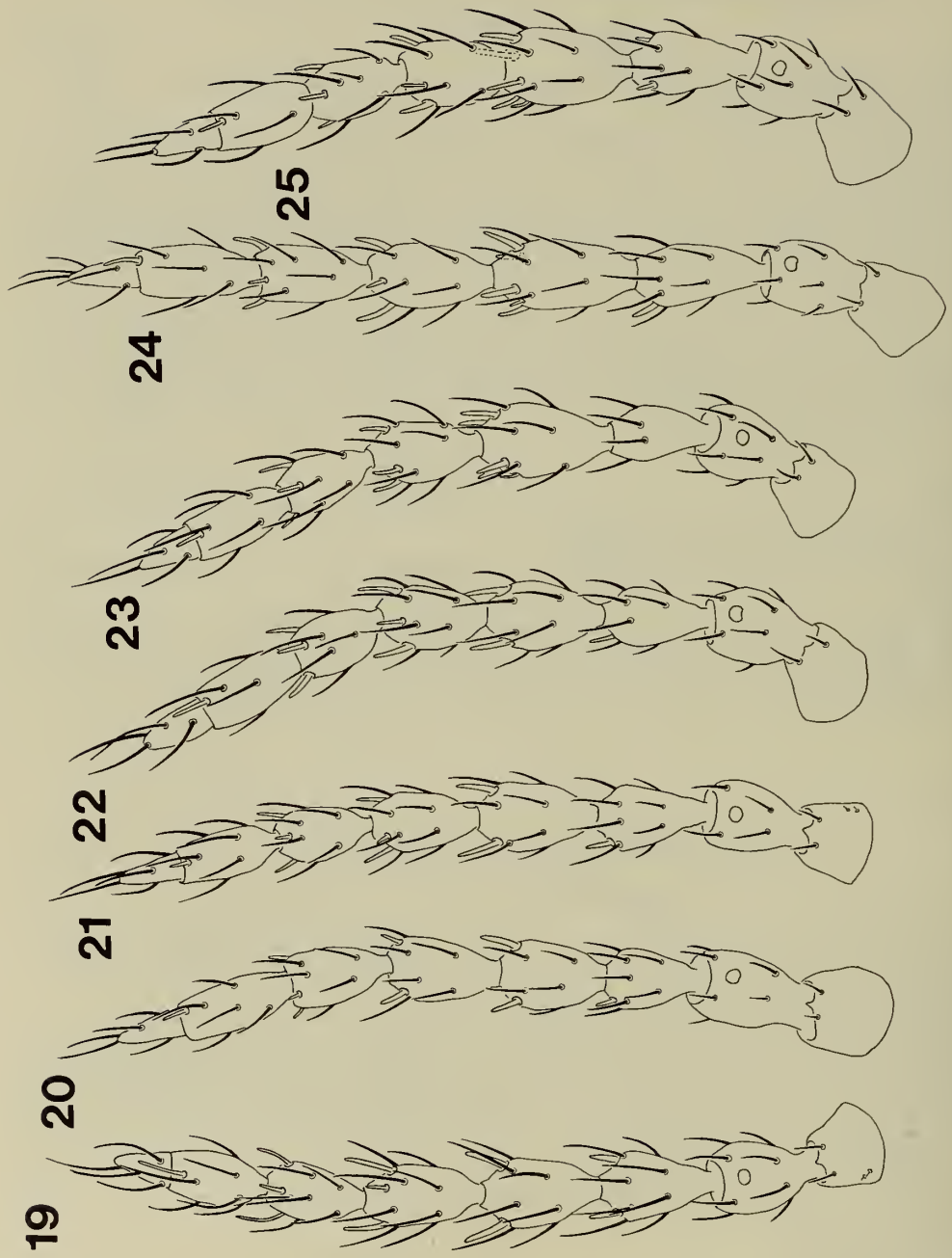
Antennal segments III and IV with 0 + 1 and 1 + 1 sense cones respectively; post-ocular setae pointed; pronotal antero-marginal setae vestigial, mid-lateral setae fairly well developed but pointed; apterous; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from three females and two males from pine needles. I have examined further material from dry twigs.

Specimens studied.

Holotype ♀ aptera, allotype ♂ aptera, India: Kodaikanal, Bryant's Park, on pine needles, 4.vi.1959 (*TNA*) (LCM).

India: Kodaikanal, 7 ♀ apterae on dry twigs, 2.i.1969 (*TNA*) (BMNH; LCM).



FIGS 19–25. *Apierygothrips* and *Haplothrips* species: antennae. 19, *A. fungosus*, paratype ♀. 20, *A. flavus*, paratype ♀ (African specimen). 21, *A. pellucidus*, paratype ♀. 22, *A. pini*, holotype ♀. 23, *A. jogensis*, ♀. 24, *H. apicalis*, lectotype ♀. 25, *A. rubiginosus*, paratype ♀.

Apterygothrips rubiginosus (Ananthakrishnan & Jagadish) **comb. n.**

(Text-figs 13, 25)

Xylaplothrips rubiginosus Ananthakrishnan & Jagadish, 1971 : 263–264. Holotype ♀ aptera, INDIA: Kodaikanal, *Lantana* sp. twigs (LCM) [examined].

Brown species with apex of tibiae yellow; antennal segment III yellow to grey-brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae pointed; pronotal antero-marginal and mid-lateral setae vestigial; apterous; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from a holotype female, an allotype male and six female and four male paratypes, all apparently apterous.

SPECIMENS STUDIED.

Holotype ♀ aptera, allotype ♂ aptera, INDIA: Kodaikanal, *Lantana* sp. twigs, 1.i.1969 (*TNA*) (LCM).

?Paratype ♀ aptera, INDIA: Kodaikanal, *Lantana* sp. twigs, 1.i.1969 (*TNA*) (LCM).

CHIRAPLOTHRIPS Priesner

Haplothrips (*Chiraplothrips*) Priesner, 1930 : 271. Type-species *Haplothrips* (*Chiraplothrips*) *faureanus* Priesner, by monotypy.
Chiraplothrips Priesner; zur Strassen, 1960 : 347.

Priesner (1964*b*) provides a key to the three described species of *Chiraplothrips*. All of these apparently have the apical margin of the fore femora 'somewhat reflexed exteriorly'. This character is, however, difficult to observe and consequently I have avoided its use in the key above. Only one species of *Chiraplothrips* is recorded from India (Ananthakrishnan, 1969).

GENERIC DEFINITION. Medium sized brown to dark brown species of Haplothripini. Maxillary stylets long, when at rest retracted far into the head capsule; maxillary bridge present; post-ocular setae pointed. Antennal segment III with 0 + 1 sense cones, segment IV with 1 + 1 sense cones. Pronotal antero-marginal and mid-lateral setae vestigial; praepectal plates present. Macropterous, fore wings with duplicated cilia. Abdominal tergites III–VII each with two pairs of well developed wing-retaining setae.

Chiraplothrips graminellus (Priesner)

(Text-figs 35, 48)

Haplothrips (*Chiraplothrips*) *graminellus* Priesner, 1938 : 113–115. Syntypes ♀, ♂, CYPRUS: Cherkes, Asomotos; [LEBANON] Syria: Beirut; SUDAN: Wad Shair (SMF, BMNH) [1 ♀, 1 ♂ examined].
Haplothrips (*Chiraplothrips*) *priesneri* Ananthakrishnan, 1961*b* : 426–428. Holotype ♀, INDIA: Madras (LCM) [not examined]. [Synonymized by zur Strassen, 1968 : 100.]
Chiraplothrips graminellus (Priesner) Priesner, 1964*b* : 434.

Brown species; antennal segment III yellow; segments IV and V brownish yellow; segments VI–VIII pale brown; fore tibiae yellow, brown at base and margins; fore tarsi yellow; all femora and mid and hind tibiae brown; mid and hind tarsi pale brown.

Antennal segments III and IV with 0 + 1 and 1 + 1 sense cones respectively; post ocular

setae pointed; pronotal antero-marginal and mid-lateral setae vestigial; fore wings with about 6–7 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

Priesner (1938) described *graminellus* from an unspecified number of females and males collected on turf and grasses in Cyprus, Lebanon and Sudan. I have examined two syntypes from Cyprus and these are both labelled 'Paratype'.

Ananthakrishnan (1961*b*) described *priesneri* from a holotype and an allotype collected on *Chloris barbata* (L.) Swartz at Madras, i. 1959 (*TNA*). I have not seen either of these specimens. Zur Strassen (1968) synonymized *priesneri* with *graminellus*.

Specimens studied.

Syntypes 1 ♀, 1 ♂, Cyprus: Cherkes, turf, viii.1933 (*G. A. Mavroumoustakis*) (BMNH).

India: Madras, 1 ♀ on grass, 11.vi.1963, 1 ♀ on grass, 11.vii.1963; Coimbatore, 3 ♀ on grass, 12.vi.1963; Tinnevelley, 1 ♀ on grass, 27.v.1965; (*TNA*) (BMNH).

HAPLOTHRIPS Amyot & Serville

Haplothrips Amyot & Serville, 1843 : 640. Type-species: *Phloeothrips albipennis* Burmeister [= *Thrips aculeata* Fabricius], by monotypy.

The genus *Haplothrips* has a world-wide distribution and comprises over 200 described species. The majority are flower-living although a number of predatory and mycophagous species have been recorded. Eleven of the 14 Indian species recognized here are flower-living. A further species originally described from galls has subsequently been recorded from flowers. The remaining two species are inquilines, one of psyllid galls and the other of galls and lepidopterous leaf-mines.

Generic definition. Medium sized, usually brown Haplothripini, rarely yellow or bicoloured. Maxillary stylets usually long and retracted far into the head capsule; maxillary bridge usually present. Post-ocular setae pointed, blunt, or expanded. Antennal segment III with at most 1 + 1 sense cones; antennal segment IV with $2 + 2^{+1}$ or more rarely 2 + 2 sense cones. Pronotal antero-marginal and mid-lateral setae vestigial to well developed; praepectal plates well developed. Usually macropterous, fore wings with or without duplicated cilia. Abdominal tergites III–VII usually with two pairs, rarely one pair, of well developed wing-retaining setae.

Subgenus ***HAPLOTHRIPS*** Amyot & Serville

Haplothrips Amyot & Serville, 1843 : 640.

The subgenus *Haplothrips* is used for species with duplicated cilia on the distal osterior margin of the fore wing.

Haplothrips (Haplothrips) andresi Priesner

(Text-fig. 38)

Haplothrips andresi Priesner, 1930 : 270–271. Syntypes ♀, ♂, Egypt: Mersa, Matrouh (SMF; BMNH) [1 ♀ examined].

Haplothrips andresi Priesner; Ananthakrishnan & Jagadish, 1966 : 257.

Dark brown to black species with fore tibiae yellow towards apex, outer margins dark; mid and hind tibiae pale yellow at apex; all tarsi yellow; antennal segment III yellow, segments IV, V and VI pale in basal two-thirds; segment VII pale in basal third or more.

Antennal segments III and IV with 0 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae pointed apically; pronotal antero-marginal and mid-lateral setae well developed; fore wings with 10–12 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from an unspecified number of males and females collected in Egypt from grass and vine leaves or inside fig fruits, 12.vi.1930 (*A. Andres*) (Priesner, 1930). No holotype was designated although the single female syntype I have examined is labelled 'Paratype'. There is a female labelled as a paratype in the SMF (pers. com. L. A. Mound), but the number and whereabouts of the remaining syntypes are unknown to me.

Priesner (1964*b*) recorded *andresi* from the flowers of *Thymelaea hirsuta* (L.) Endlicher [Thymelaeaceae] in the north of Egypt. The species is also recorded from Palestine (Rivnay, 1933; Priesner, 1936) and southern India (Ananthakrishnan & Jagadish, 1966). Two Indian females identified by Professor Ananthakrishnan as *andresi* have been examined during the course of this study and these represent *tenuipennis* Bagnall. I have not seen Indian material of *andresi*

Specimens studied.

Syntype ♀, Egypt: Mersa, Matrouh, in fig fruits, 12.vi.1930 (*A. Andres*) (BMNH).

Haplothrips (*Haplothrips*) *bagrolis* Bhatti

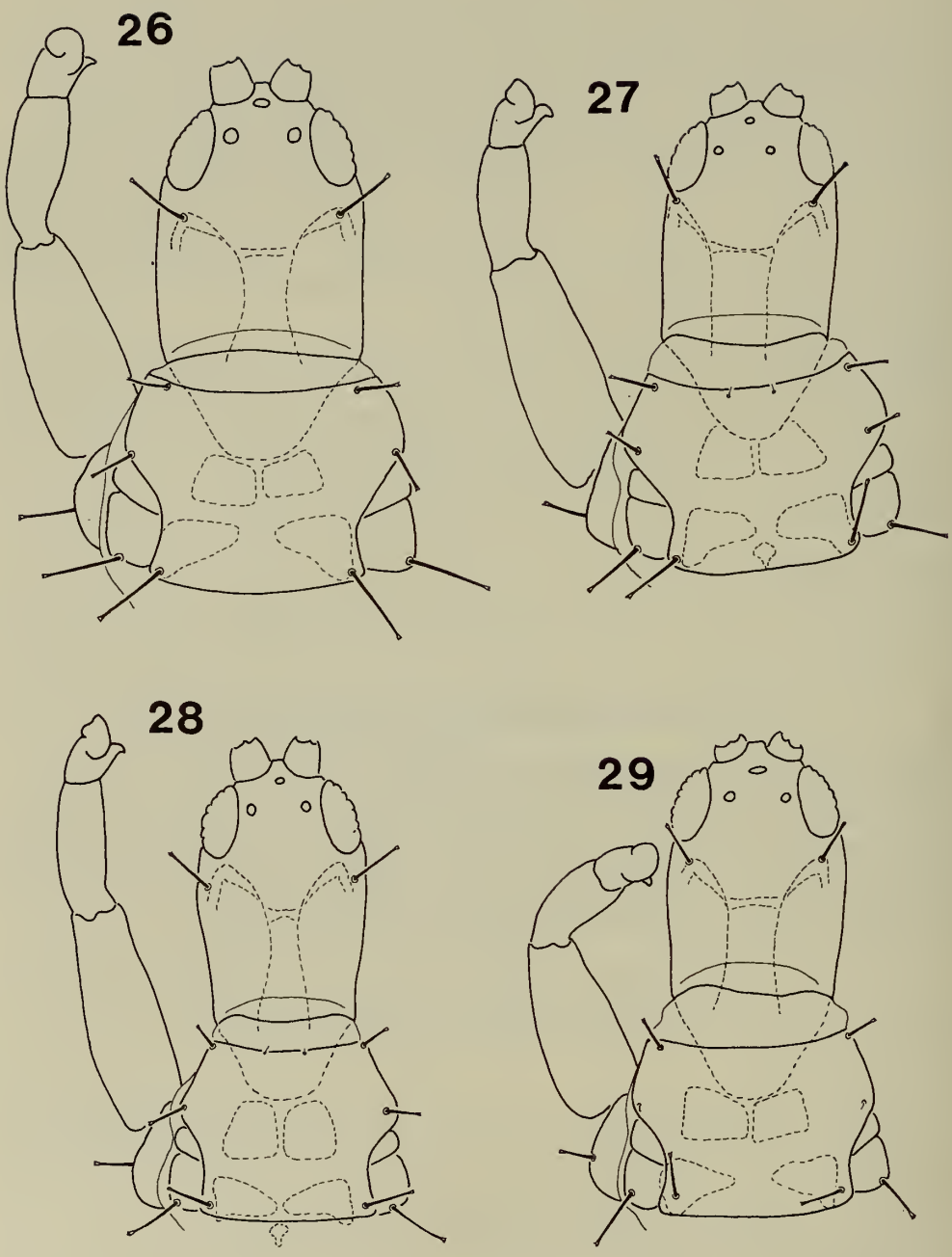
Haplothrips bagrolis Bhatti, 1973 : 535–537. Holotype ♂, India: Himachal Pradesh, Bagrol, Kangra District (Hans Raj College, Delhi) [not examined].

Brown species; antennal segment III pale yellowish; segments IV–VI light brown; fore tibiae brown on outer margin; tarsi yellow.

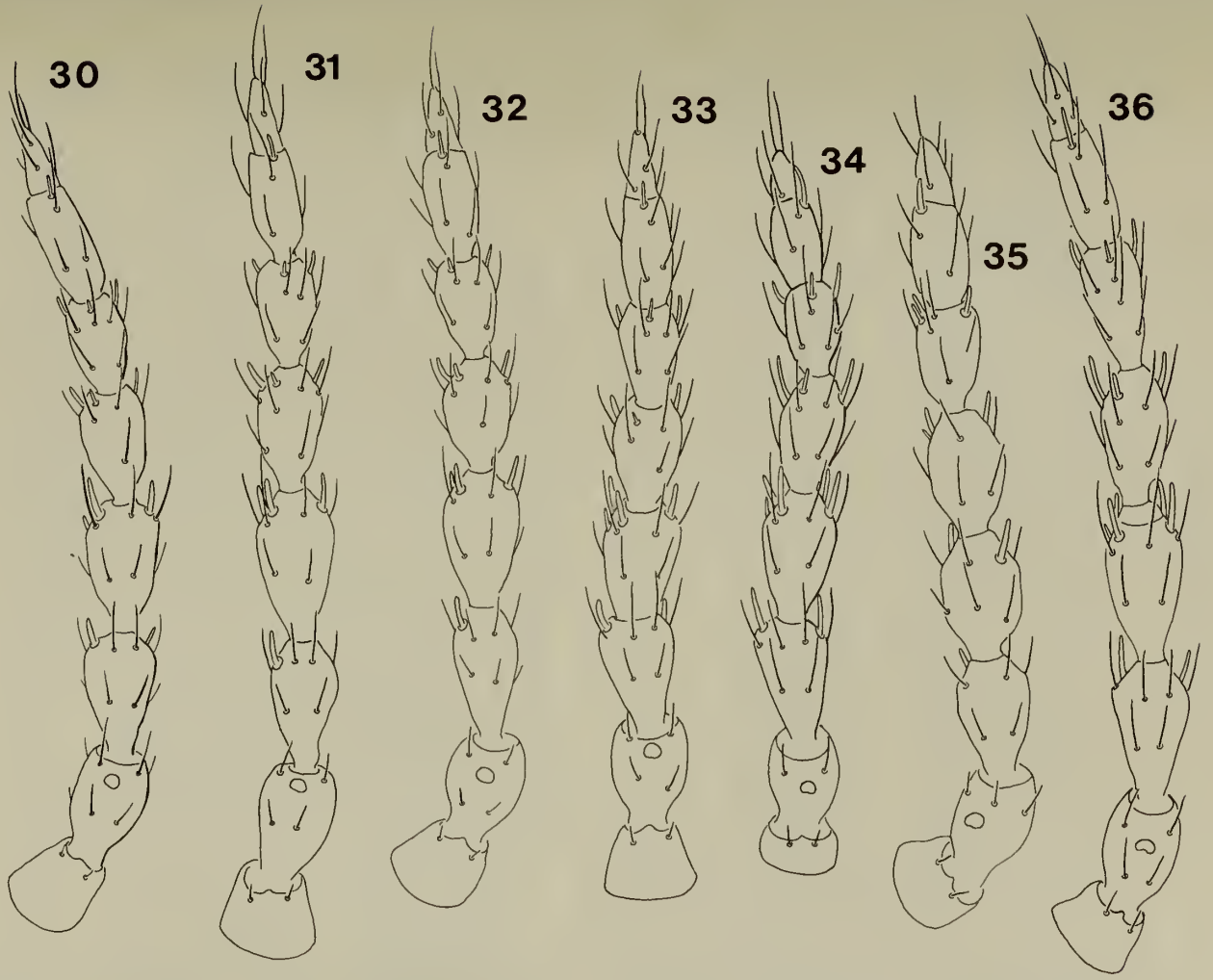
Antennal segments III and IV with 0 + 1 and 2 + 2 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae fairly well developed and expanded apically; macropterous, fore wings with 5–9 duplicated cilia.

This species was described from a male holotype and an allotype and paratype female collected on wheat at Bagrol, Kangra District, 20.iii.1971 (*S. K. Ahluwalia*). I have not seen any of these specimens. The above diagnosis is drawn from the original description.

There are three males and four associated females from Pakistan in the BMNH which could represent this species, but I have not compared them with the type-material. One male and one associated female were collected on *Rubus* sp. [Rubiaceae] at Murree, 5.vi.1961; one male and three associated females were collected from *Plantago* [Plantaginaceae] flowers at Kwai, 14.v.1963; and one male was collected from the roots of an unidentified plant at Thapla, 15.x.1961. Apart from the bifid aedeagus of the males, these specimens are indistinguishable from *ganglbaueri* (cf. p. 249).



FIGS 26–29. *Karnyothrips* species: heads, pronota and left forelegs. 26, *alpha*, holotype ♀. 27, *flavipes*, ♀ (North American specimen). 28, *melaleucus*, ♀. 29, *nigriflavus*, paratype ♀.



FIGS 30–36. Antennae. 30–33, *Karnyothrips* species. 30, *melaleucus*, holotype ♀. 31, *alpha*, holotype ♀. 32, *nigriflavus*, paratype ♀. 33, *flavipes* ♀ (North American specimen). 34, *Haplothrips bicolor*, ♀. 35, *Chiraplothrips graminellus*, ♀. 36, *Haplothrips pirus*, syntype ♀.

Haplothrips (*Haplothrips*) *bicolor* (Ananthakrishnan) **comb. n.**

(Text-figs 34, 37)

Xylaplothrips bicolor Ananthakrishnan, 1964*a* : 53–54. Syntypes 2 ♀, 2 ♂, India: Bapatla (LCM) [not examined].

Bicoloured species; head, thorax, posterior half and median third of abdominal segment VIII, abdominal segment IX and tube brown; abdominal segments II–VII yellow, segments III–VII each with a small median pale brown transverse patch near anterior margin; antennal segment I and much of segment II pale brown; antennal segments III–VI yellow; segments VII and VIII brown; all legs yellow except outer margin of fore femora which are tinged with brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed; macropterous, fore wings with 5–6 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

Ananthakrishnan (1964*a*) described *bicolor* from two females and two males collected on psyllid galls at Bapatla, 1952 (*TNA*). None of these specimens was designated as holotype and I have not examined any of them. The above diagnosis is based on the original description and a single female identified by Professor Ananthakrishnan.

Specimen studied.

India: Courtallam, 1 ♀ on grass, 10.x.1964 (*TNA*) (LCM).

Haplothrips (*Haplothrips*) *ceylonicus* Schmutz

Haplothrips ceylonicus Schmutz, 1913 : 1038–1039. Syntypes ♀ ♂, Sri Lanka: Peradenya (presumed lost) [not examined].

Brown species; antennal segments III–VI yellow, segments VII and VIII brown; fore tibiae, apical half to one-third of mid and hind tibiae and all tarsi yellow.

Antennal segments III and IV with o + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 6–9 duplicated cilia; median setae (B_1) on abdominal tergite IX slightly expanded apically.

Schmutz (1913) described *ceylonicus* from an unspecified number of females and males collected at Peradenya on *Cassipourea* sp. [Rhizophoraceae] and *Crotalaria striata* Candolle [Leguminosae] by Uzel. These are presumed lost. The above diagnosis is based on three females from India collected on *Ficus* [Moraceae] and identified by Dr J. S. Bhatti.

Priesner (1933*b*) redescribed *ceylonicus* from material collected in Java, Sumatra and Riouw Archipelago. I have examined some of these specimens, from Wai Lima, Lampongs, Sumatra. Contrary to the redescription these specimens have 1 + 1 sense cones on antennal segment III and are identical with *tenuipennis* Bagnall.

I have also examined seven females from India (USNM) and one female from Sri Lanka (SMF) identified by Professor Ananthakrishnan and the late Professor Dr Priesner as *ceylonicus*. These are indistinguishable from *tenuipennis*.

SPECIMENS STUDIED.

INDIA: Madras, 3 ♀ on *Ficus* sp., viii.1973 (*J. S. Bhatti*) (Hans Raj College, Delhi).

Haplothrips (*Haplothrips*) *ganglbaueri* Schmutz

Haplothrips Ganglbaueri Schmutz, 1913 : 1034. Syntypes ♀, SRI LANKA: Peradenya (presumed lost) [not examined].

Haplothrips ceylonicus var. *vernoniae* Priesner, 1921 : 4. Syntypes 5 ♀, 1 ♂, JAVA: Semerang (4 ♀, 1 ♂ in SMF) [4 ♀, 1 ♂ examined]. **Syn. n.**

Zygothrips andhra Ramakrishna, 1928 : 290–291. Holotype ♀, INDIA: Guntur, Madras Presidency (Tamil Nadu University College, Coimbatore) [examined]. **Syn. n.**

Haplothrips priesnerianus Bagnall, 1933 : 327–328. Lectotype ♂, INDIA: Allahabad (BMNH), designated by Mound (1968 : 114) [examined]. **Syn. n.**

Brown species; antennal segments I and II brown; segment III brownish yellow; segments IV, V and VI successively darker; fore tibiae yellow with brown margins.

Antennal segments III and IV with 0 + 1 and 2 + 2^{+1} sense cones respectively; post ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 5–8 duplicated cilia; median setae (B_1) on abdominal tergite IX blunt to slightly expanded.

Schmutz (1913) described *ganglbaueri* from an unspecified number of females collected at Peradenya, Sri Lanka on rice flowers by Uzel. These are presumed lost. Priesner (1921; 1933*b*) redescribed *ganglbaueri* from material of both sexes collected in Java, Sumatra and Krakatau. This material is indistinguishable from *priesnerianus*.

The variety *vernoniae* was described from five females and one male collected at Semerang, Java. I have examined four female and one male syntypes labelled 'COTYPE' and cannot distinguish them from the type-series of *priesnerianus*.

Zygothrips andhra was described from a unique female holotype collected at Guntur, Madras Presidency, India. I cannot distinguish this specimen from *priesnerianus* or *bagrolis*. Dr Bhatti (pers. com.), however, considers *andhra* as a synonym of *ganglbaueri*, a view I have accepted here.

Haplothrips priesnerianus was originally described from an unspecified number of females and males collected at Allahabad on flowers of *Lantana* [Verbenaceae], 26.iii.1910 (*A. D. Imms*). One of the males, which is labelled 'TYPE', was designated as the lectotype by Mound (1968) and is deposited in the BMNH with two females and two males regarded as paralectotypes. The above synonymy is based on comparison of the original description of *ganglbaueri* (Schmutz, 1913), Priesner's redescriptions (Priesner, 1921; 1933*b*), the lectotype and paralectotypes of *priesnerianus* and numerous specimens from India identified by Professor Ananthakrishnan and Dr Bhatti as *ganglbaueri*.

Bhatti (1973) distinguished *ganglbaueri* from *bagrolis* on the metanotal sculpture, the length of the pronotal postero-angular setae and the shape of antennal segment III and the male aedeagus. Apart from the shape of the male aedeagus these characters vary from one specimen of *ganglbaueri* to another and are here considered unreliable. I have not found any characters which could be used to distinguish females of *bagrolis* and *ganglbaueri*. The females referred to below under

'Specimens studied' have been identified by association with males of *ganglbaueri*. The unassociated females that I have examined are listed separately. These could represent either *ganglbaueri* or *bagrolis*.

Specimens studied.

Syntypes 4 ♀, 1 ♂ of *ceylonicus* var. *vernoniae*, Java: Semerang, 'aus Blümen und verkruppelten, teilweise gerolten Blättern von *Vernonia cinerea*', 3.vii.1912 (*W. Docters v. Leeuwen*) (SMF). Holotype ♀ of *andhra*, India: Guntur, Madras Presidency, on cholam shoots (*T. V. Ramakrishna* No 152) (Tamil Nadu University College, Coimbatore). Lectotype ♂, paralectotypes 3 ♀, 2 ♂ of *priesnerianus*, India: Allahabad, flowers of *Lantana* in jungle, 26.iii.1920 (*A. D. Imms*) (BMNH).

India: Annamalais, 1 ♀, 3 ♂ on grass, 26.ix.1965; Bangalore, 2 ♀, 1 ♂ on grass, 20.iv.1964; Kodaikanal, 1 ♂ on grass, 25.v.1965; Valparai, 1 ♀, 1 ♂ on grass, 26.ix.1965 (*TNA*) (USNM); Rajasthan, Udaipur, 7 ♀, 5 ♂, 4.xi.1964 (*CIE*) (BMNH). Pakistan: Muree, 31 ♀, 7 ♂ on *Arundinella nepalensis* Trinius, 16 ♀, 2 ♂ on *Cymbopogon martini* (Roxburgh) Watson, 5.vi.1961 (*CIE*); Nowsera, 1 ♀, 1 ♂ on *Tagetes africana*, 3.i.1964 (*CIE*); Peshawar, 9 ♀, 4 ♂ on *Pennisetum typhoideum* L. Richard, 30.ix.1964; (BMNH). Bangladesh: Dacca, 1 ♀, 1 ♂ on wheat, iv.1969 (*Agric. Res. Inst.*); Ishardi 6 ♀, 1 ♂ on Chinese paddy, 4.v.1968 (*Ma Hasib Plant Quarantine St.*); (BMNH). Solomon Is.: Guadalcanal, 27 ♀, 9 ♂, on rice, xi–xii.1965 (*M. McQuillan*); Guadalcanal, Kukum Agric. St., 1 ♀, 1 ♂ on grass and flowers, 21.x.1965 (*P. N. Lawrence*); (BMNH).

Unassociated females of *ganglbaueri* or *bagrolis*.

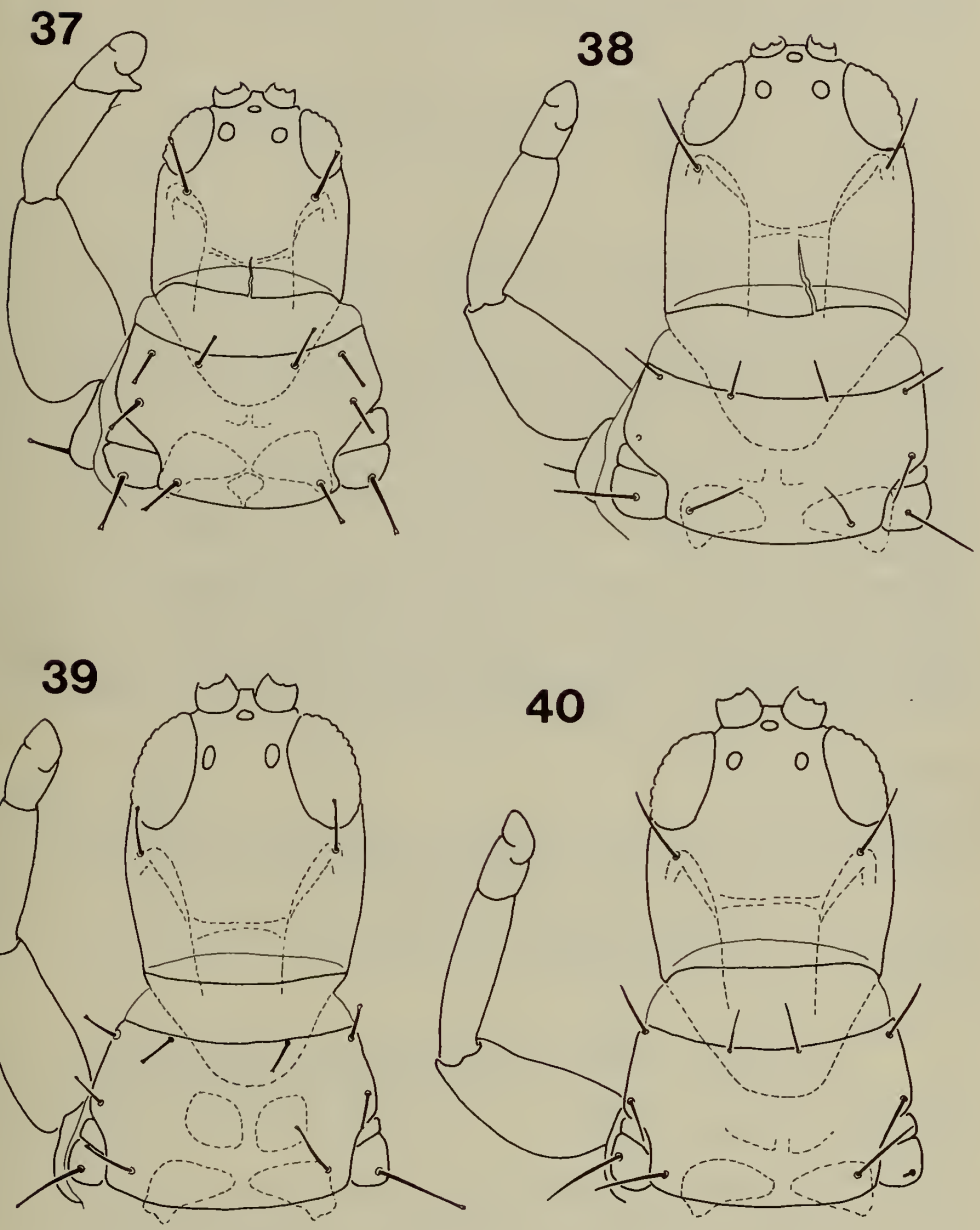
India: Rawalpindi, 9 ♀ on *Cymbopogon distans* (Nees) W. Watson, 11.vii.1960 (*CIE*); Indore, 1 ♀ on *Sorghum vulgare* Persoon, 1.x.1966 (Coll. Agric.); Madras, 3 ♀ on grass, 17.iv.1963 (*TNA*); Mussoorie, 1 ♀ on fern, 13.vi.1967 (*TNA*); New Delhi, 1 ♀ on grass 10.viii.1966 (*TNA*) (BMNH; USNM). Pakistan: Lyallpur, 4 ♀ on wheat, 26.v.1968 (*Ayub Agric. Res. Inst.*) (BMNH). Bangladesh: Dacca, 4 ♀ on rice, 15.ii.1966 (CIBC); Dacca, 2 ♀ on water hyacinth, 1961 (*Govt. Entomologist*) (BMNH). Java: Buitzenzorg, Medan S.O.K., 1 ♀ on *Imperator exaltata* (Roxburgh) Brongniart (*L. Fulmek*) (BMNH). Solomon Is.: Guadalcanal, 11 ♀ on ?*Brachiaria mutica* (Forsskal) Stapf, 17.v.1966 (*M. McQuillan*); Guadalcanal, Papananism, 1 ♀ Oct. 1965 (*P. Greenslade*) (BMNH). Philippines: Alicia Isabella, 1 ♀ on rice seedlings, 26.v.1972 (*A. D. Pawar*) Los Banos, I.R.R.I. Lagina, 1 ♀ on rice panicles, 20.xii.1971 (*A. D. Pawar*) (BMNH).

Haplothrips (Haplothrips) gowdeyi (Franklin)

(Text-fig. 39)

Anthothrips gowdeyi Franklin, 1908 : 724. Syntypes 31 ♀, Barbados (10 ♀ in USNM; 21 ♀ in Massachusetts Agricultural College) [not examined].

Haplothrips sororcula Schmutz, 1913 : 1036–1037. Syntypes ♀, ♂, Sri Lanka : Peradenya (1 ♀ in SMF; depository of remainder unknown) [1 ♀ examined]. **Syn. n.**



FIGS 37–40. *Haplothrips* species: heads, pronota and left forelegs. 37, *bicolor*, ♀. 38, *andresi*, paratype ♀ (Egyptian specimen). 39, *gowdeyi*, ♀ (African specimen). 40, *reuteri*, ♀ (European specimen).

Haplothrips soror Schmutz, 1913 : 1036–1037. Syntypes ♀, ♂, Sri Lanka: Peradenya (2 ♀ in SMF; depository of remainder unknown) [2 ♀ examined]. **Syn. n.**
Haplothrips gowdeyi (Franklin) Watson, 1921 : 38.

Brown species; antennal segments III–V yellow; segment IV yellow-brown; segments VII and VIII brown; mid and hind tibiae brown; all tarsi pale brown.

Antennal segments III and IV with 1 + 1 and 2 + 2 +1 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 4–9 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

Schmutz (1913) described *sororcula* from an unspecified number of females and males collected on 'Blättern des Zimtbaumes und in *Canna*-Blüten' and 'Blüten von *Crotalaria striata* D.C. und in Reis'; and *soror* from an unspecified number of females and males on 'Bluten von ? ? an den Ufern des Maveli' and 'Blattern vom Zimtbaum'. As pointed out above, male syntypes of *sororcula* were collected with female syntypes of *ceylonicus* Schmutz; and male syntypes of *soror* were collected with female syntypes of *ganglbaueri* Schmutz. Fortunately, however, some female syntypes of *sororcula* and *soror*, labelled as 'Cotype' and 'Cotypen' respectively, are deposited in the SMF. I have examined these and cannot distinguish them from *gowdeyi*. The number and whereabouts of the remaining syntypes is unknown to me.

Haplothrips gowdeyi is a pantropical species breeding in the flowers of Gramineae. It may, however, be frequently collected in the flowers and on the foliage of numerous other plant families. The female examined from Madras on *Amaranthus* had been misidentified as *ramakrishnai* Karny (= *nigricornis* Bagnall); and the two females from Madras on grass as *coloratus* Trybom.

Specimens studied.

Syntypes 2 ♀ of *soror*, Sri Lanka (Ceylon): Mahaveli (*Uzel*) (SMF). Syntype ♀ of *sororcula*, Sri Lanka (Ceylon): Peradenya, auf Zimtbaum (*Uzel*) (SMF).

India: Conjeeveram, 4 ♀ on grass, 1.vi.1963; Kodaikanal, 1 ♀ on grass, 12.vi.1963; Udaipur, 1 ♀ on wild flowers, 30.v.1966; Madras, 1 ♀ on *Amaranthus*, 22.vi.1963; Tambaram, 1 ♀, 20.iv.1963; Pollachi, 1 ♀ on *Eleusine*, 10.vi.1963; Madras, 2 ♀ on grass, 18.vii.1965; (*TNA*) (USNM).

Haplothrips (*Haplothrips*) *longisetosus* Ananthakrishnan

Haplothrips longisetosus Ananthakrishnan, 1955 : 610–611. Syntypes 2 ♀, India: Malabar (LCM) [not examined].

This species was originally described from two females collected at Malabar from wild flowers. No holotype was designated in the original description and I have not studied either specimen. According to the original description and its accompanying figure antennal segment III has four sense cones and antennal segment IV has two sense cones. If this is correct then *longisetosus* does not belong in *Haplothrips* or any of the related genera discussed in this account. However, if this statement and the figure are the result of an error, as is suggested by the

reference 'antennae as in *H. gowdeyi*', then *longisetosus* is similar to *gowdeyi* and *tenuipennis*. The 'considerably longèr' major setae distinguish *longisetosus* from both of these species.

Haplothrips (Haplothrips) pirus Bhatti

(Text-fig. 36)

Haplothrips pirus Bhatti, 1967 : 23. Syntypes ♀, ♂, INDIA: New Delhi (Hans Raj College, Delhi) [1 ♀, 1 ♂ examined].

Yellow species with tube dark brown in slightly less than distal two-thirds; antennal segment V brown in distal half; segment VI brown in slightly less than distal two-thirds; segments VII and VIII dark brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed; macropterous, fore wings with 4–6 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

This species was described from an unspecified number of males and females collected from small brownish leaf-galls and from lepidopterous leaf-mines of *Syzigium*, 21.vi.1966 and 25.ix.1966, New Delhi (*J. S. Bhatti*). I have examined a female and male syntype labelled 'PARATYPE' and 'ALLOTYPE' respectively. Contrary to the original description 'antennal seg. 2' does not have '2 sense cones'; and antennal segment '3' does not have '4 sense cones'. I assume that Bhatti confused antennal segment III and IV with II and III. In fact segment II only has the characteristic companiform sensilla (see Heming, 1975) and segment III has 1 + 1 sense cones and segment IV has 2 + 2^{+1} sense cones.

SPECIMENS STUDIED.

Syntypes 1 ♀, 1 ♂, INDIA: New Delhi, leaf mines of Jamun (*Syzygium*) 21.vi.1966 25.ix.1966 (*J. S. Bhatti*) (Hans Raj College, Delhi).

Haplothrips (Haplothrips) reuteri Karny

(Text-fig. 40)

Anthemothrips reuteri Karny, 1907 : 51. Syntypes, [?YUGOSLAVIA] 'Österreich-Ungarn': Karlopago [?Karlobag] (depository unknown) [not examined].

Haplothrips reuteri (Karny) Priesner, 1921 : 14.

Haplothrips reuteri (Karny); Moulton, 1929 : 4.

Haplothrips tenuisetosus Bagnall, 1933 : 320–321 [examined]. [Synonymised by Priesner, 1964 : 151.]

Haplothrips satanus Bagnall, 1933 : 321–323 [examined]. [Synonymised by Priesner, 1964: 151.]

Brown species with antennae brown, segment III slightly paler than segment II; fore tibiae paler towards apex: fore tarsi yellow-brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae pointed; pronotal antero-marginal and mid-lateral setae well developed and pointed; macropterous, fore wings with 4–8 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

Karny (1907) described *reuteri* from an unspecified number of specimens collected at Karlopago in flowers of *Knautia* sp. [Dipsaceae] 26.vii.1905. The original description does not make it clear whether these specimens included females as well as males. The above diagnosis is based on the examination of the holotype females of *satanus* Bagnall and *tenuisetosus* Bagnall, synonymised with *reuteri* by Priesner (1964).

The only published record of *reuteri* in India appears to be that of Moulton (1929). I have examined 14 of the 20 males and females on which this record is based.

Specimens studied.

Holotype ♀ of *satanus*, France: Perpignan, on *Centaurea solstitialis* L., viii.1926 (*R. S. Bagnall*) (BMNH). Holotype ♀ of *tenuisetosus*, Sudan: Wad Medani, *Dolichos lablab* L., 7.iv.1932 (*A. P. G. Michelmore*) (BMNH).

India: Dehra Dun, 9 ♀, 5 ♂ (*J. C. M. Gardner*) (CAS).

Haplothrips (*Haplothrips*) *tenuipennis* Bagnall

(Text-fig. 42)

Haplothrips tenuipennis Bagnall, 1918 : 210. Lectotype ♂, India: Darjeeling District, Rington (BMNH), designated by Mound (1968 : 118) [examined].

Haplothrips ceylonicus var. *mangiferae* Priesner, 1933*b* : 359. Syntypes ♀♂, Java: Semarang (SMF) [not examined]. [Synonymized by Mound, 1968 : 118.]

Brown species with antennal segments III–VI yellow, segments IV–VI slightly tinged with brown at apex; segment II paler towards apex; segments VII and VIII pale brown; fore tibiae and all tarsi yellow.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 6–10 duplicated cilia; median setae (B_1) on abdominal tergite IX blunt to slightly expanded.

Bagnall (1918) described *tenuipennis* from an unspecified number of males and females collected on rose and tea bushes. There are a total of eleven females and six males in the BMNH all bearing type data. Of these one female and one male are labelled 'Type' and one female and three males are labelled 'Cotype'. The remaining nine females and two males are not labelled as type-material but are here assumed to be some of Bagnall's syntypes. The male labelled 'Type' was designated as the lectotype by Mound (1968), the remaining 11 females and five males are regarded here as paralectotypes.

Haplothrips ceylonicus var. *mangiferae* was originally described from '♀♀♂, Semarang, Java; 25–VIII–1912, in Bluten von *Mangifera indica* L., leg Docters van Leeuwen.' Some of these syntypes are labelled as cotypes and Mound (1968) refers to these incorrectly as paratypes.

All of the specimens in the USNM of *tenuipennis* had been misidentified by Professor Ananthakrishnan as follows: from Bhopal on *Polygonum*, Madras on *Zizyphus*, and Trichur and Tambaram on grass as *ceylonicus*; from Madras on

grass as *ganglbaueri* and *coloratus*; from Valparai on tea as *andresi*; and from Poona on Mango as *mangiferae*.

Specimens studied.

Lectotype ♂, paralectotypes 11 ♀, 5 ♂, India: Darjeeling District, Rington T. E. on rose and tea bushes, 14.vi.1916 (*E. A. Andrews*) (BMNH).

India: Bhopal, 1 ♀ on *Polygonum* infl. 18.x.1966; Madras, 1 ♀ on grass, 17.iv.1963; Madras, 4 ♀ on *Zizyphus* fl., 12.vi.1963; Poona, 7 ♀, 1 ♂ on Mango infl., 23.i.1965; Trichur, 1 ♀ on grass, 6.x.1963; Tamboram, 1 ♀ on grass, 20.iv.1963; Valparai, 2 ♀ on tea fl., 26.ix.1965; (*TNA*) (USNM); Indore, 7 ♀, 2 ♂ on *Mangifera indica* L., 1 ♀, 1 ♂ on *Phaseolus lunatus* L., 1 ♀, 1 ♂ on *Dolichos* lablab L. fl. 14.iii.1967 (*Coll. Agric.*); Assam, Darjeeling, 8 ♀, 1 ♂ on tea shoots, 1965 (*Toklai Expt. St.*); Udaipur, 1 ♀ on flowering plant, 11.v.1966 (*Udaipur Univ.*); (BMNH).

Subgenus ***TRYBOMIELLA*** Bagnall

Trybomiella Bagnall, 1926 : 548. Type-species: *Haplothrips bagnalli* Trybom, by original designation.

The subgenus *Trybomiella* is used for species of *Haplothrips* without duplicated cilia on the distal posterior margin of the fore wing.

Haplothrips (Trybomiella) apicalis Bagnall

(Text-figs 9, 17, 24)

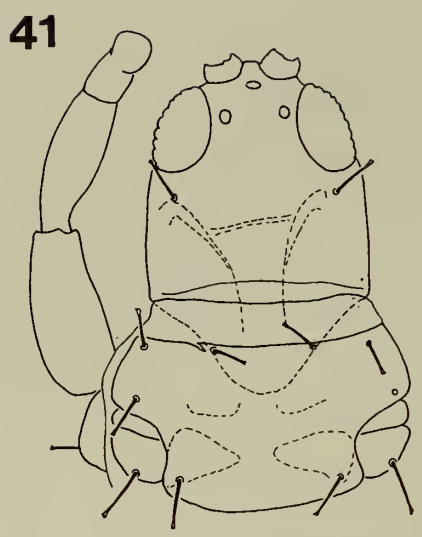
Hindsiana apicalis Bagnall, 1915 : 323. Lectotype ♀ microptera, India: Almora, Kumaon, (BMNH), designated by Mound (1968 : 109) [examined].
Haplothrips (*Hindsiana*) *apicalis* (Bagnall) Priesner, 1933*b* : 361–363.
Haplothrips (*Trybomiella*) *apicalis* (Bagnall); Ananthakrishnan, 1962 : 473–475.
Haplothrips (*Trybomiella*) *apicalis* (Bagnall); Ananthakrishnan, 1969 : 138.

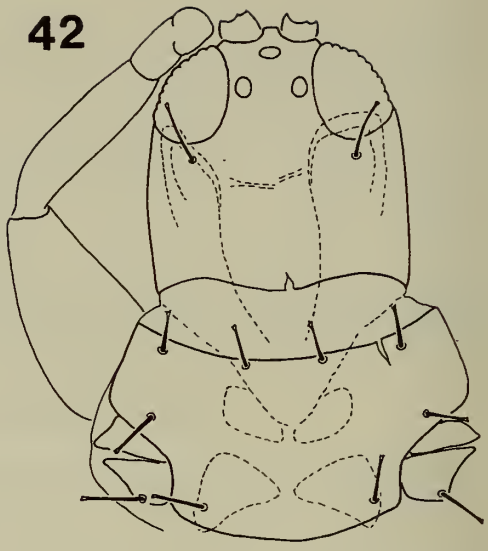
Bicoloured species; head, antennal segments I, II and VI–VIII, pterothorax, anterior third of abdominal segments II–VII, abdominal segments VIII–X, and mid and hind tibiae brown; prothorax, fore legs and mid and hind femora yellow-brown; remainder yellow.

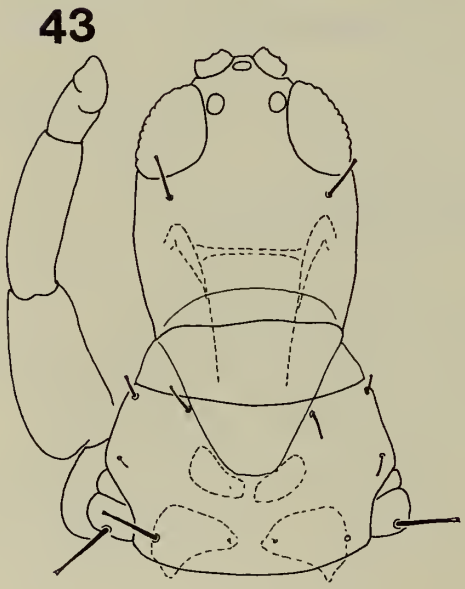
Antennal segments III and IV with 0 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; micropterous, brachypterous, or macropterous, fore wings, even when fully developed, without duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

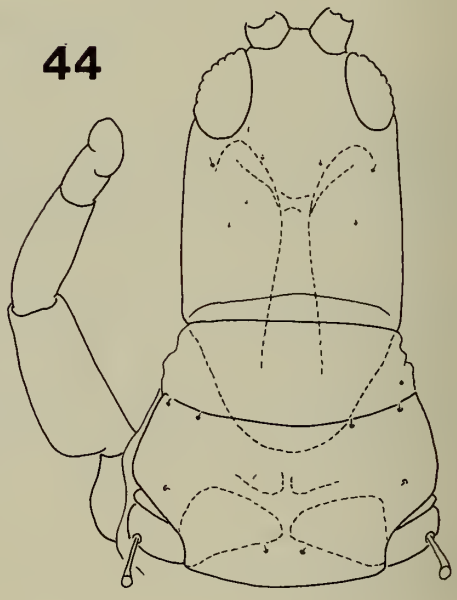
Bagnall (1915) described *apicalis* from 'several specimens swept from a jungle plant' at Almora, India. The micropterous lectotype female and a second micropterous female, assumed to be a paralectotype, are in the BMNH. The number and whereabouts of the remaining specimens of the type-series are unknown to me.

Unlike other species of the genus, *apicalis* has only one pair of well developed wing-retaining setae on each of abdominal tergites III–VII. The fore wings, even when fully developed, lack duplicated cilia, as do species of the subgenus *Trybomiella*. However, *apicalis* is not closely related to these species and is being









FIGS 41–44. *Haplothrips* species: heads, pronota and left forelegs. 41, *ganglbaueri* (lectotype ♀ of *priesnerianus*). 42, *tenuipennis*, lectotype ♀. 43, *articulosus*, ♀ (African specimen). 44, *euphorbiae*, paratype ♀.

transferred elsewhere to a new genus by Dr Bhatti (pers. comm.). The reduction of the wing-retaining setae and absence of duplicated cilia may be associated with the grass-living habit.

This species is recorded from Java (Priesner, 1933*b*) and India (Ananthakrishnan, 1969). I have studied specimens from India and Pakistan.

Specimens studied.

Lectotype ♀ microptera, paralectotype ♀ microptera, India: Almora, Kumaon, on a jungle plant, 4.vii.1911 (*O. Paiva*) (BMNH).

India: Madras, 2 ♀ micropterae, 2 ♀ macropterae (wings lost), 3 ♂ micropterae on *Cynodon* [Gramineae], 21.v.1963 (*TNA*) (BMNH; USNM); Poona, 1 ♀ microptera, 2 ♂ macropterae on grass, 23.i.1965 (*TNA*) (USNM); Surat, 1 ♂ macroptera on grass, 28.x.1965 (*TNA*) (USNM); 7 ♀ micropterae, no further data, Bagnall Reg. 163 (BMNH). Pakistan: Taimergarha, 1 ♀ microptera, 30.i.1964 (*CIBC*) (BMNH).

Haplothrips* (*Trybomiella*) *articulosus Bagnall

(Text-fig. 43)

Anthothrips bagnalli var. *pallicornis* Trybom, 1911 : 10. Syntypes ♀, ♂, Kenya: Mombasa (Riksmuseum, Stockholm) [not examined].

Haplothrips articulosus Bagnall, 1926 : 548–549. Holotype ♀, Tanzania: Morogoro (BMNH) [examined].

Haplothrips trybomianus Priesner, 1927 : 70. Replacement name for *bagnalli* var. *pallicornis* Trybom. [Synonymized by Mound, 1968 : 109.]

Haplothrips (*Trybomiella*) *derisor* Priesner, 1935 : 324. Holotype ♀, Sierra Leone [examined]. [Synonymized by Mound, 1968 : 109.]

Brown species; antennal segments III–VI brownish yellow, segments VII–VIII pale brown; apex of fore tibiae and fore tarsi brownish yellow; mid and hind tibiae brown; mid and hind tarsi pale brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae slightly expanded apically; pronotal antero-marginal and mid-lateral setae well developed and slightly expanded apically; macropterous, fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX slightly expanded apically.

Bagnall (1926) described *articulosus* from an unspecified number of specimens of both sexes. There are a total of two females and five males in the BMNH including the holotype female and these are labelled either 'TYPE' or 'COTYPE'.

Ananthakrishnan (1969) lists *articulosus* as occurring in India although I know of no published records of this species outside the African continent. There are, however, two females in the USNM from Hyderabad, India which I cannot distinguish from *articulosus*.

Specimens studied.

Holotype ♀, paratypes 1 ♀, 5 ♂ of *articulosus*, Tanzania: Morogoro, sunflower blossom, 9.i.1925 (*A. H. Ritchie*) (BMNH). Holotype ♀, paratypes 5 ♀, 1 ♂ of *derisor*, Sierra Leone: *Erigeron sumatrensis* Retzius leaves (*E. Hargreaves*) (BMNH). India: Hyderabad, 2 ♀ on grass, 25.vi.1964 (*TNA*) (USNM).

Haplothrips (*Trybomiella*) *bagnalli* (Trybom)

Anthothrips bagnalli Trybom, 1910 : 65. Syntypes 374 ♀, 105 ♂, South Africa; South West Africa; Botswana (SMF; ?Riksmuseum, Stockholm) [13 ♀, 9 ♂ ?Syntypes examined].
Haplothrips bagnalli (Trybom) Karny, 1912 : 325.
Haplothrips bagnalli (Trybom); Faure, 1955 : 219.

Brown species; antennal segment III slightly paler than segment II; fore tibiae yellow brown medially and towards apex; fore tarsi greyish yellow; mid and hind tibiae and tarsi brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae vestigial; macropterous, fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX blunt or slightly expanded.

Ananthakrishnan (1969) lists *bagnalli* as occurring in India although I know of no published records outside southern Africa. I have not seen any specimens of *bagnalli* from India. Four Indian specimens identified as *bagnalli* by Professor Ananthakrishnan have been examined. These specimens, from Tambaram on grass, could not be distinguished from the closely related species, *nigricornis* Bagnall.

Specimens studied.

?Syntypes 13 ♀, 9 ♂, South Africa (*L. Schultze*) (SMF).

Haplothrips (*Trybomiella*) *clarisetis* Priesner

Haplothrips clarisetis Priesner, 1930 : 237–238. Syntypes 4 ♀, South Africa & Egypt: (SMF) [not examined].
Haplothrips clarisetis Priesner; Faure, 1955 : 223–230.

Brown species; antennal segment III yellow-brown, paler than segment II; segment IV slightly darker than III, nearly as dark as V; segments V–VIII brown; apex of fore tibiae and tarsi brownish yellow; mid and hind tarsi pale brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae slightly expanded apically; pronotal antero-marginal setae well developed and slightly expanded apically, mid-lateral setae vestigial; macropterous, fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from one female collected at Rosslyn, Pretoria, on cabbage, 25.iii.1919 (*J. C. Faure*); one female at White River, Transvaal on lemons, 27.viii.1926; and two females at Orman Gardens, Cairo on *Chenopodium* sp. (*H. Priesner*). I have not seen any of these specimens. The above diagnosis is based on the excellent redescription given by Faure (1955) and material in the BMNH from South Africa, Angola, Egypt, Israel and Palestine. At present I am unable to distinguish *clarisetis* from the Australian species *robustus* Bagnall.

The Indian material in the USNM that I have examined had been misidentified by Professor Ananthakrishnan as follows: from Bareilly on *Celosia*, and Madras and Tambaram on grass as *nigricornis*; and from Baroda and Madras on *Amaranthus*, and Coonoor on bamboo as *ramakrishnai*.

SPECIMENS STUDIED.

INDIA: Bareilly, 1 ♀ on *Celosia*, 3.viii.1966; Baroda, 4 ♀, on *Amaranthus*, 26.x.1965; Coonoor, 1 ♀ on bamboo sheath, 8.vi.1963; Madras, 2 ♀, 1 ♂ on *Amaranthus*, 22.iv.1963; 2 ♀ on grass, 22.i.1964; Metupaleyam, 1 ♀, 1 ♂, on *Celosia*, 23.ii.1966; Tambaram, 1 ♀, 8.viii.1966; (*TNA*) (USNM).

Haplothrips (*Trybomiella*) *euphorbiae* Priesner

(Text-fig. 44)

Haplothrips (?) *euphorbiae* Priesner, 1931 : 1–4. Holotype ♀, SUMATRA: Medan (SMF) [examined].

Haplothrips euphorbiae Priesner; Priesner, 1933*b* : 347.

Brown species; apex of fore tibiae and fore tarsi greyish yellow.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae reduced; pronotal antero-marginal and mid-lateral setae vestigial; macropterous, fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

Priesner (1931) described *euphorbiae* from an unspecified number of females and males, including a type female, collected on galls on *Euphorbia hirta* at Medan, Sumatra. I have examined the holotype and three paratype females plus further material from Sumatra and India. The three Indian specimens from Waltair on grass in the USNM had been misidentified by Professor Ananthakrishnan as *talpa* Priesner.

SPECIMENS STUDIED.

Holotype ♀, paratypes 3 ♀, SUMATRA: Medan, on *Euphorbia hirta* L., v.1931 (*L. Fulmek*) (SMF).

SUMATRA: Medan, S. O. K., 2 ♀ on *Euphorbia hirta* L., xii.1923 (*L. Fulmek*) (BMNH). INDIA: Anand, 4 ♀, 1 ♂ on *Euphorbia* fls, 27.x.1965; Waltair, 3 ♀ on grass, 20.ix.1964; (*TNA*) (USNM).

Haplothrips (*Trybomiella*) *nigricornis* (Bagnall)

Anthothrips nigricornis Bagnall, 1910 : 425–426. Syntypes 12 ♀, 3 ♂, SOUTH AFRICA: Cape Town (BMNH) [examined].

Haplothrips ramakrishnai Karny, 1926 : 218. Holotype ♀, INDIA: Coimbatore (SMF) [examined]. **Syn. n.**

Haplothrips nigricornis (Bagnall); Faure, 1955 : 208–218.

Brown species; antennal segment III slightly paler than segment IV, segments IV–VIII slightly paler than segments I and II; apex of fore tibiae and fore tarsi yellow-brown.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post ocular setae slightly expanded apically; pronotal antero-marginal and mid-lateral setae vestigial; macropterous fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX pointed or blunt.

Bagnall described *nigricornis* from 'numerous specimens' of both sexes collected in South Africa on flowers of *Diplopappus*, *Europs*, *Olipterus* and *Sebaea*. There

are twelve females and three males in the BMNH mounted on two slides. One slide is labelled 'TYPES' and the other 'COTYPES'. The only other data on the slides are 'S. AFRICA/R. S. BAGNALL' and 'TUBULIFERA/*Haplothrips nigricornis* Bagn./♀♀♂♂' and 'Bagnall Coll./B.M. Reg. No. 1932–339'.

Karny (1926) described *ramakrishnai* from a unique female collected inside *Chrysanthemum* flowers, 13.viii.1918 (*Ramakrishna*). I have compared this and four other Indian specimens with the syntypes of *nigricornis* and further material from South Africa, Angola, Rhodesia, Tanzania, Uganda and Ethiopia in the BMNH. The Indian specimens had been misidentified by Professor Ananthakrishnan as *bagnalli*.

Specimens studied.

Syntypes 12 ♀, 3 ♂ of *nigricornis*, South Africa (BMNH). Holotype ♀ of *ramakrishnai*, India: Coimbatore, *Chrysanthemum* flowers, 3.vii.1918 (*Ramakrishna*) (SMF).

India: Tambaram, 4 ♀ on grass, 29.iv.1965 (*TNA*) (USNM).

Haplothrips (Trybomiella) talpa Priesner

Haplothrips talpa Priesner, 1930 : 243. Syntypes ♀, ♂, South Africa: Transvaal, Potgietersrust (depository unknown) [not examined].

Body brown; antennal segment III yellow-brown, segments IV–VI slightly darker than III but paler than VII and VIII; fore tarsi and sometimes apex of fore tibiae yellow-brown.

Antennal segments III and IV with 0 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae short and pointed; pronotal antero-marginal and mid-lateral setae vestigial; macropterous, fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX pointed or blunt.

The syntypes of *talpa* were collected at Potgietersrust, South Africa (Faure, 1955) and not Rustenburg (Priesner, 1930). I do not know their whereabouts; they are not in either Priesner's collection (SMF) or Faure's collection (National Insect Collection, Pretoria). The Indian specimens examined agree with Faure's (loc. cit.) excellent redescription.

Specimens studied.

India: Waltair, 3 ♀, 3 ♂, on grass, 27.x.1965 (*TNA*) (USNM).

Haplothrips (*Trybomiella*) *tirumalraoi* Ramakrishna & Margabandhu

Haplothrips (*Trybomiella*) *tirumalraoi* Ramakrishna & Margabandhu, 1931 : 1038. Holotype ♂, India: Northern Circars (presumed lost) [not examined].

Ramakrishna & Margabandhu (1931) described *tirumalraoi* from a unique male collected on *Colocasia* (*V. Tirumal Rao*). This specimen is apparently lost. According to the original description antennal segment III bears one sense cone, the fore wings lack duplicated cilia and the post-ocular setae are blunt.

KARNYOTHRIPS Watson

Karynia [sic] Watson, 1922 : 6. Type-species: *Karynia weigeli* Watson [= *Anthothrips flavipes* Jones; synonymized by Hood, 1927 : 175]. [Misspelling for *Karnyia*; preoccupied by *Karnyia* Shelford, 1909.]
Karnyothrips Watson, 1924 : 23. [Replacement name for *Karnyia* Watson.]

The genus *Karynothrips* is used here for a group of *Haplothrips*-like species with forwardly directed fore tarsal claws, $1 + 2^{+1}$ or fewer sense cones on antennal segment IV and two pairs of well developed wing-retaining setae on each of abdominal tergites III–VII. In addition the post-ocular setae are expanded apically and the pronotal antero-marginal setae are vestigial.

Only two species, *flavipes* Jones and *nigriflavus* Ramakrishna, are listed by Ananthakrishnan (1969) as occurring in India. However, the so called colour forms of *nigriflavus* referred to by Ananthakrishnan (1965) are recognized as three distinct species, *nigriflavus*, *melaleucus* Bagnall and *alpha* sp. n. A further species, *mucidus* (Ananthakrishnan & Jagadish) is here transferred to *Karnyothrips* from *Xylaplothrips*. Of the five species recognized here from India at least two are predatory. One of these and two other species are bicoloured and are associated with grasses.

Generic definition. Medium sized brown or bicoloured Haplothripini. Maxillary stylets long and retracted far into the head capsule; maxillary bridge present; post-ocular setae expanded apically. Antennal segment III with $0 + 1$ or $1 + 1$ sense cones; segment IV with $1 + 2^{+1}$ or fewer sense cones. Fore tarsi with a forwardly directed claw. Pronotal antero-marginal setae vestigial; mid-lateral setae well developed and expanded apically. Abdominal tergites III–VII each with two pairs of well developed wing-retaining setae. Macropterous, fore wings with or without duplicated cilia.

Karnyothrips alpha sp. n.

(Text-figs 26, 31)

Ananthakrishnan (1965*b*) listed five colour forms of *nigriflavus* as follows:

'a) Head alone brown, tube brown, rest yellow
b) Head, prothorax, tube brown
c) Head, prothorax, very little of mesothorax, abdominal segment IX and tube brown
d) Head, prothorax, pterothorax, abdominal segments VIII to X brown
e) Almost uniformly brownish individuals.'

I have examined 24 ♀ and 11 ♂ identified by Professor Ananthakrishnan as *nigriflavus* and of these 6 ♀ and 7 ♂ fall into group a; 10 ♀ and 3 ♂ fall into group b and 8 ♀ fall into group d. The remaining 1 ♂ does not fit into any group but comes closest to group e. The group b specimens are identical to the 13 ♀ paratypes of *nigriflavus* that I have examined and have $0 + 1$ and $1 + 2$ sense cones on antennal segments III and IV respectively and the median setae (B_1) on abdominal tergite IX are expanded apically. However, the group d specimens examined are identical with the holotype of *melaleucus* Bagnall and have $1 + 1$ and $1 + 1^{+1}$ sense cones

on antennal segments III and IV respectively and the median setae (B_1) on abdominal tergite IX are pointed. Moreover the group a specimens examined differ from both *nigriflavus* and *melaleucus* and have 0 + 1 and 1 + 2 sense cones on antennal segments III and IV respectively and the median setae (B_1) on abdominal tergite IX are pointed. In addition, none of these group a specimens has duplicated cilia on the distal posterior margin of the fore wing. All specimens of *nigriflavus* and *melaleucus* that I have examined have at least one duplicated cilium on one fore wing or the other. The group a specimens are therefore recognized as a distinct species and described here as *alpha* sp. n.

The single anomalous male near group e has 0 + 1 and 1 + 2^{+1} sense cones on antennal segments III and IV respectively and the median setae (B_1) on abdominal tergite IX are expanded apically, as in *mucidus*. It differs from *mucidus* in colour, i.e. antennal segment III is yellow not brown, and in my opinion probably represents a further new species. Since this specimen is unique I have not described it as a new species.

A total of 6 ♀ and 7 ♂ of *alpha*, 22 ♀ and 2 ♂ of *nigriflavus* and 38 ♀ of *melaleucus* have been examined. Within each species the number of sense cones on antennal segments III and IV, the form of the median setae (B_1) on abdominal tergite IX, the range of the number of duplicated cilia on the fore wing and the colour pattern are consistent.

Bicoloured species of *Karnyothrips*; head, tube, sometimes disal portion of abdominal segment IX, antennal segments I, VII and VIII brown; antennal segment VI usually pale brown in distal half; remainder yellow.

Antennal segments III and IV with 0 + 1 and 1 + 2 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and expanded apically; macropterous, fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

Measurements of holotype female (smallest–largest holotype female) in μm: total length 2280 (2016–2280); head length 222 (204–222); pronotal length 159 (150–159); tube length 112 (109–117); tube width at base 61 (57–61).

Measurements of smallest–largest paratype males in μm: total length 1296–1680; head length 174–192; pronotal length 111–132; tube length 96–108; tube width at base 43–50.

Holotype ♀, INDIA: Palghat, on bamboo, 28.ix.1965 (*TNA*) (BMNH).

Paratypes. INDIA: 2 ♀, 2 ♂ collected with holotype; Calicut, 1 ♀, 1 ♂ on bamboo, 4.x.1963; Calicut, 1 ♀ on bamboo, 15.x.1964; Chalakudi, 1 ♂ on bamboo, 5.xi.1963: Perintalmanna, 1 ♀ on bamboo, 6.x.1963; Omalur, 1 ♂ on sugar cane, 18.vi.1966; Madras, 1 ♂ on grass, 25.i.1966; Yercaud, 1 ♂ on bamboo, 19.vi.1966; (*TNA*) (BMNH; LCM; USNM).

Karnyothrips flavipes (Jones)

(Text-figs 27, 33)

Anthothrips flavipes Jones, 1912 : 18–19. Holotype ♀, U.S.A.: California, San Jose (USNM) [not examined].
Karnyothrips flavipes (Jones) Hood, 1927 : 175.
Karnyothrips flavipes (Jones); Ananthakrishnan, 1969 : 139.

Brown species; antennal segment III yellow at base, pale brown at apex, segment IV sometimes pale in basal third; femora brown; tibiae yellow-brown to yellow at apex; all tarsi yellow.

Antennal segments III and IV with 1 + 1 and 1 + 2^{+1} sense cones respectively; post ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and expanded apically; macropterous, fore wings with 1–5 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

This species is cosmopolitan (Stannard, 1957; as *jonesianus*) and predates Coccidae, Aleyrodidae and also Acarina on a wide variety of plants (Priesner, 1964*b*). Ananthakrishnan (1969) recorded *flavipes* from India. I have not seen any Indian specimens of this species. The BMNH collection contains material from Egypt, Cyprus and U.S.A. (California and Hawaii).

Karnyothrips melaleucus (Bagnall)

(Text-figs 28, 30)

Hindsiana melaleuca Bagnall, 1911 : 61–62. Holotype ♀, DENMARK: Copenhagen (BMNH) [examined].

Karnyothrips melaleuca (Bagnall) Hood, 1927 : 176.

Bicoloured species; head, thorax, abdominal segments VIII or IX–X brown; pelta and abdominal segments II–VII or VIII yellow, segments III–VII each with a small median transverse pale brown patch near anterior margin; antennal segment I pale brown, segments II–V yellow, VI yellow-brown, VII and VIII brown; fore femora brown in basal half fading to yellow towards apex; mid and hind femora and all tibiae and tarsi yellow.

Antennal segments III and IV with 1 + 1 and 1 + 1^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial; mid-lateral setae expanded apically; wings fully developed, fore wings with 0–4 duplicated cilia (always at least 1 on one fore wing or the other); median setae (B_1) on abdominal tergite IX pointed or blunt.

The Indian specimens examined had been misidentified as *Karnyothrips nigriflavus* by Professor Ananthakrishnan (see discussion under *alpha*). This species is a pantropical thrips living amongst grasses, sometimes in association with scale insects. The BMNH contains material from Denmark (in a palm house), Madeira, Kenya, U.S.A. (Hawaii), Trinidad, Brazil, Australia, West Malaysia, Java, Vietnam, China and India. Unlike *alpha* and *nigriflavus* the males of *melaleucus* are unknown.

SPECIMENS STUDIED.

Holotype ♀, DENMARK: Copenhagen, on cruciferous flowers in palm house, 30.vi.1909 (*R. S. Bagnall*) (BMNH).

INDIA: Palghat, 2 ♀, 28.ix.1965 (BMNH); Kulatupuzha, 2 ♀ on wild grass, 2.ix.1966 (BMNH); Thimbam, 2 ♀ on bamboo, 4.ix.1967 (1 ♀ BMNH; 1 ♀ USNM); Mundumalai, 1 ♀ on bamboo, 24.xii.1966 (USNM); Chalakudi, 1 ♀ on bamboo, 5.xi.1963 (USNM); Calicut, 1 ♀ on bamboo, 4.x.1963 (USNM); all collected by *TNA*. CHINA: Canton, 1 ♀ on *Bambusa*, iii.1938 (BMNH). VIETNAM: 1 ♀ on *Vanda*, 29.xii.1962 (*H. A. Woolford*) (USNM).

Karnyothrips mucidus (Ananthakrishnan & Jagadish) **comb. n.**

Xylaplothrips mucidus Ananthakrishnan & Jagadish, 1971 : 260–261. Holotype ♀, India: Vyithri (Wynad) (LCM) [examined].

Bicoloured species; head, thorax, posterior half of abdominal segment IX, and tube brown, rest of body yellow; fore femora brown with yellow apex; fore tibiae yellow-brown; fore tarsi yellow; mid and hind legs yellow; antennal segments I brown, segment II mainly yellow, segment III yellow, segments IV–VIII brown.

Antennal segments III and IV with 0 + 1 and 1 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial; mid-lateral setae well developed and expanded apically; macropterous, fore wings with about 4 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

This species was originally described from two females and one male collected from dry twigs at Vyithri (Wynad).

Specimens studied.

Holotype ♀, allotype ♂, paratype ♀, India: Vyithri (Wynad), on dry twigs, 15.viii.1969 (*TNA*) (LCM).

Karnyothrips nigriflavus Ramakrishna

(Text-figs 29, 32)

Karnyothrips nigriflavus Ramakrishna, 1934 : 496. Holotype ♀, India: Coimbatore (LCM) [not examined].

Bicoloured species; head, prothorax and tube brown; base and apex of antennae pale brown; remainder yellow.

Antennal segments III and IV with 0 + 1 and 1 + 2 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae. well developed; macropterous, fore wings with 1–5 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

Ramakrishna (1934) described *nigriflavus* from 'numerous specimens (T.V.R. No. 269a)' collected on bamboo in Coimbatore. He referred to a 'type female' but made no mention of any males. Professor Ananthakrishnan kindly loaned a slide of *nigriflavus* from Ramakrishna's collection (T.V.R. 269). This unfortunately was broken in transit, although none of the specimens were damaged. The slide originally held 13 females of *nigriflavus* and a single specimen of an unidentified *Xylaplothrips* sp. I have remounted all of these singly on slides.

I regard the colour forms of *nigriflavus* referred to by Ananthakrishnan (1965*a*) as at least three distinct species (see discussion under *alpha*).

Specimens studied.

Paratypes 13 ♀, India: Coimbatore, on bamboo (*T. V. Ramakrishna* 269) (LCM; BMNH).

India: Palghat, 3 ♀, 1 ♂ on bamboo, 4.ix.1967 (BMNH); Perintalmanna, 1 ♀ on grass, 5.xi.1963 (BMNH); Aryankavu, 1 ♀, 21.ii.1966 (USNM); Yercaud, 1 ♀ on

bamboo, 19.vi.1966 (USNM); Tumkur, 1 ♀ on bamboo, 5.ix.1967 (USNM); Dindigul, 1 ♀ on bamboo, 28.vii.1967 (USNM); Calicut, 1 ♀, 1 ♂ on bamboo, 4.x.1963 (USNM); Chalakudi, 1 ♀ on bamboo, 5.xi.1963 (USNM); all collected by *TNA*.

PRAEPODOTHRIPS Priesner & Seshadri

Praepodothrips Priesner & Seshadri, 1952 : 407–410. Type-species: *Praepodothrips indicus* Priesner & Seshadri, 1952 : 408–410, by original designation.

Praepodothrips is used here for a group of four large grass-inhabiting haplothripines. Three of these have relatively large heads and small pronota and 1 + 1 sense cones on antennal segment IV. The fourth species has the head only about as long as the pronotum and 2 + 2^{+1} sense cones on antennal segment IV. This last-mentioned species possibly warrants a genus of its own but is retained for the present in *Praepodothrips*.

Generic definition. Large brown or bicoloured species of Haplothripini. Head usually relatively large; maxillary stylets retracted far into the head capsule; maxillary bridge present. Antennal segment III with 0 + 1 to 1 + 2 sense cones; segments IV with 1 + 1 or 2 + 2^{+1} sense cones; post ocular setae pointed to expanded. Pronotal antero-marginal and mid lateral setae vestigial. Macropterous, forewings with or without duplicated cilia. Abdominal tergites III–VII each with two pairs of well developed wing-retaining setae.

Praepodothrips cymbapogoni Ananthakrishnan

(Text-figs 46, 50)

Praepodothrips cymbapogoni Ananthakrishnan, 1956 : 136–138. Holotype ♀, India: Simuralai Hills (LCM) [not examined].
Praepodothrips cymbapogoni Ananthakrishnan; Ananthakrishnan, 1960 : 574.

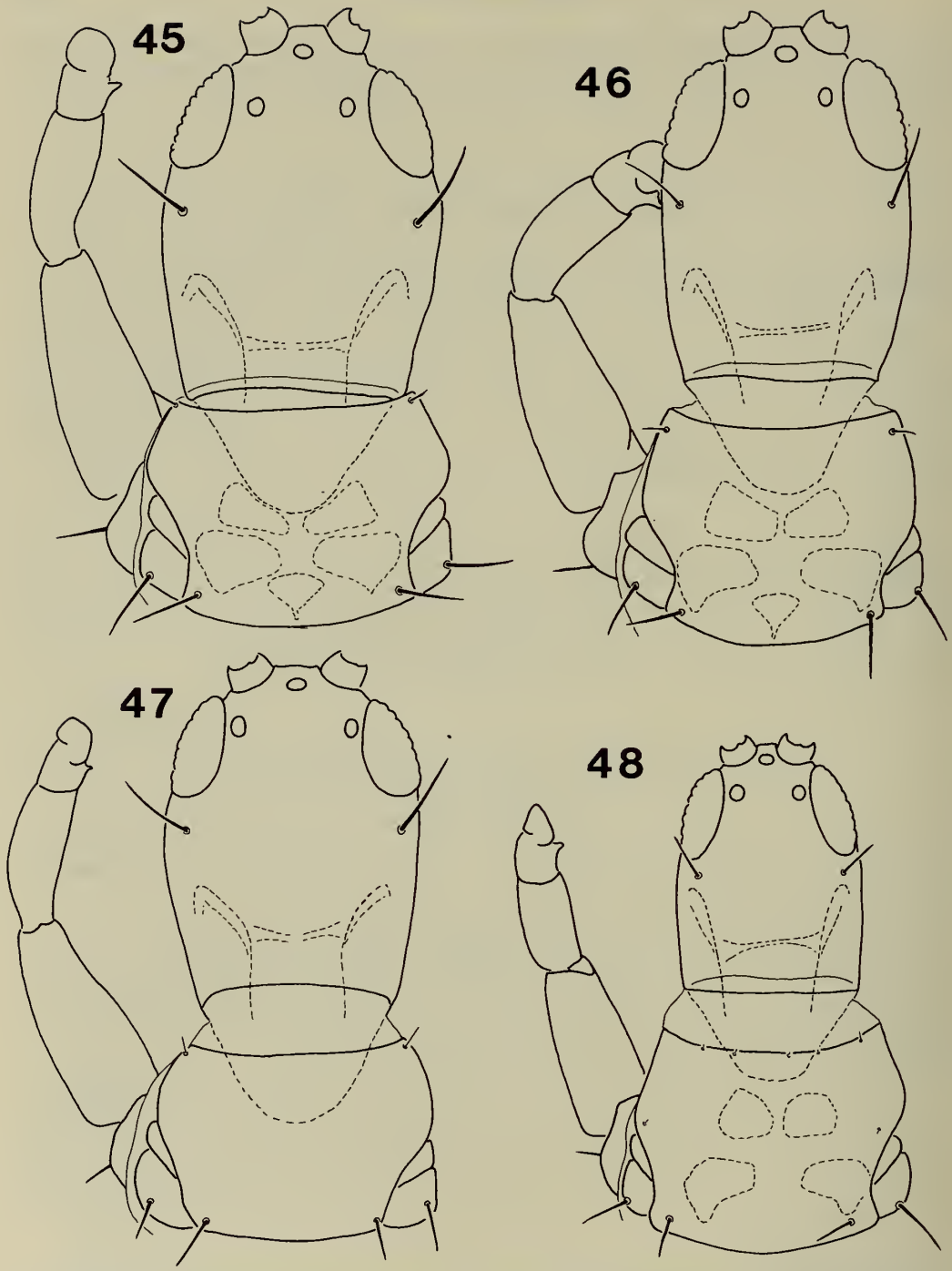
Brown species; apical half to third of antennal segment II, segments III–VI yellow, remainder of antennae pale brown; apex of fore femora, all tibiae and tarsi yellow.

Antennal segments III and IV each with 1 + 1 sense cones; post-ocular setae pointed; pronotal antero-marginal setae apparently vestigial; macropterous, fore wings with 5–7 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from two females collected on *Cymbapogon citratus* (Candolle) Stapf from Sirumalai Hills, Madras Province (*TNA*) (Ananthakrishnan, 1956). The only specimen examined for the present study, which was identified by Professor Ananthakrishnan, is unfortunately mounted ventral side up and the pronotal setae are not readily discernible.

Specimen studied.

India: Coonoor, 1 ♀ on *Cymbapogon citratus* (Condolle) Stapf, iv.1958 (*TNA*) (BMNH).



FIGS 45–48. Heads, pronota and left forelegs of *Praepodothrips* and *Chiraplothrips* species. 45, *P. indicus*, paratype ♀. 46, *P. cymbopogoni*, ♀. 47, *P. nigrocephalus*, holotype ♀. 48, *C. graminellus*, paratype ♀.

Praepodothrips indicus Priesner & Seshadri

(Text-figs 45, 49)

Praepodothrips indicus Priesner & Seshadri, 1952 : 408–410. Syntypes ♀, ♂, INDIA: Valparai (Tamil Nadu University, Coimbatore; Zoological Survey, Calcutta; SMF) [2 ♀ examined].

Bicoloured species; head, thorax, abdominal segments IX–X brown; abdominal segment VIII yellow in anterior third, brown in posterior two-thirds, segments II–VII yellow, segments III–VI tinged brown medially, segment VII also tinged brown in posterior fourth; antennal segments I, basal half and interior distal portion of segment II, segment VIII brown; all legs yellow, margins of fore femora slightly tinged with brown.

Antennal segments III and IV each with 1 + 1 sense cones; post-ocular setae pointed, rarely blunt; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and pointed; macropterous, fore wings with 4–8 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from 'several individuals of both sexes' from Valparai, south India, collected on an unknown host plant 'but most likely Gramineae sp'. The two syntypes examined are both labelled 'Paratype'.

SPECIMENS STUDIED.

Syntypes 2 ♀, INDIA: Valparai, ix.1945 (*E. R. G. Menon*) (SMF).

INDIA: Pachmarhi, 5 ♀ on grass, 21.xi.1966; Valparai, 1 ♀, 2 ♂ on lemon grass, 26.ix.1965; Ooty, 1 ♀ on *Imperata* grass, 25.ii.1966; Yercaud, 1 ♂, on *Imperata* grass, 17.vi.1966; Salem, 1 ♀, 1 ♂ on grass, 19.vii.1963; (*TNA*) (BMNH).

Praepodothrips nigrocephalus Ananthakrishnan

(Text-figs 47, 51)

Praepodothrips nigrocephalus Ananthakrishnan, 1964*b* : 228. LECTOTYPE ♀, INDIA: Kodaikanal Hills (LCM), here designated [examined].

Bicoloured species; mainly yellow; head, posterior third of abdominal segment IX, tube antennal segment I and most of segment II and segment VIII brown; remainder yellow.

Antennal segments III and IV with 0 + 1 and 1 + 1 sense cones respectively; post-ocular setae pointed; pronotal antero-marginal setae vestigial, mid-lateral setae vestigial; macropterous fore wings without duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from '18 females and 3 males' from grasses, Kodaikanal Hills, India (Ananthakrishnan, 1964*b*). The female and male syntype examined are labelled 'Holotype' and 'Allotype' respectively. The female is here designated as the lectotype, the remaining 17 females and 3 males being regarded as paralectotypes.

SPECIMENS STUDIED.

Lectotype ♀, paralectotype ♂, INDIA: Kodaikanal Hills, 9.xii.1963 (*TNA*) (LCM).

Praepodothrips priesneri Ananthakrishnan

(Text-fig 52)

Praepodothrips priesneri Ananthakrishnan, 1955 : 608–612. Holotype ♀, INDIA: S., Madras (LCM) [examined].

Dark brown species; antennal segment III–VII almost entirely yellow; apex of fore femora yellow; fore tibiae yellow at base and apex, tinged brown medially on margins; mid and hind tibiae yellow at base; all tarsi yellow.

Antennal segments III and IV with 1 + 2 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae vestigial; macropterous, fore wings with 6–9 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed or blunt.

Although *priesneri* is a fairly large grass-inhabiting haplothripine, as are the other species treated here under *Praepodothrips*, its head is only about as long as the pronotum and there are 2 + 2^{+1} sense cones on antennal segment IV.

SPECIMENS STUDIED.

Holotype ♀, allotype ♂, INDIA: S., Madras, bamboo sheaths, 12.vi.1954 (*TNA*) (LCM).

XYLAPLOTHRIPS Priesner

Haplothrips (*Xylaplothrips*) Priesner, 1928 : 572. Type-species: *Haplothrips fuliginosus* (Schille), by monotypy.
Xylaplothrips Priesner; Priesner, 1964*a* : 171.

The genus *Xylaplothrips* was erected as a subgenus of *Haplothrips* by Priesner (1928). He distinguished *Xylaplothrips* from *Haplothrips* sensu stricto by the symmetrical antennal segment III bearing two sense cones and also by the fungus-feeding habit. Priesner (1964*a*) elevated *Xylaplothrips* to generic rank. Subsequently *Xylaplothrips* has been used by authors for fungus-feeding *Haplothrips*-like species regardless of the number of sense cones on antennal segment III.

The 10 species recorded from India and discussed here under *Xylaplothrips* are probably polyphyletic and moreover none of them are strictly congeneric with *fuliginosus*, which is European.

GENERIC DEFINITION. Small to large species of Haplothripini. Maxillary stylets long, retracted far into the head capsule, maxillary bridge present; post-ocular setae expanded apically. Antennal segment III usually with 1 + 2 sense cones, sometimes fewer; segment IV usually with 2 + 2^{+1} sense cones, sometimes fewer. Pronotal antero-marginal setae usually well developed, sometimes vestigial; mid-lateral setae well developed and usually expanded apically. Usually macropterous, rarely apterous; fore wings, when present and fully developed, with duplicated cilia. Abdominal tergites III–VII each with two pairs of well developed wing-retaining setae.

Xylaplothrips debilis Ananthakrishnan & Jagadish

(Text-fig 56)

Xylaplothrips debilis Ananthakrishnan & Jagadish, 1971 : 266–267. Holotype ♀, INDIA: Kulatupuzha (Kerala) (LCM) [examined].

Brownish species; head, thorax and tube brown, rest of body brownish yellow; antero-median regions of abdominal segments II–VIII with brownish patches; legs yellow except median portions of femora which are shaded with brown; antennal segments I and V–VIII brown, segment II brown in basal half, yellowish apically, segment III yellow in basal half, brown apically.

Antennal segments III and IV each with 1 + 1 sense cones; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 4–6 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was described from two females collected at Kulatupuzha and two females collected at Aryankavu. One of the female paratypes from Aryankavu has been examined for the present study but this differs from the holotype female from Kulatupuzha in having 1 + 2 and 2 + 2 sense cones on antennal segments III and IV respectively and cannot be distinguished from *pusillus*. The holotype female of *debilis* is very similar to *pusillus* and it is possible that this female is merely an aberrant specimen of *pusillus*. The female of *debilis* in the USNM that I have examined had been misidentified by Professor Ananthakrishnan as *tener*. This specimen has identical data to a female of *ligs* in the USNM and it may be that the two were collected together.

Specimens studied.

Holotype ♀, India: Kulatupuzha (Kerala) dry twigs, 7.x.1969 (*TNA*); paratype ♀, India: Aryankavu (Kerala) dry twigs, 12.xi.1969 (*TNA*) (USNM).

India: Tirupathi, 1 ♀ on dry twig, 31.vii.1969 (*TNA*) (USNM).

Xylaplothrips emineus Ananthakrishnan & Jagadish

(Text-fig. 55)

Xylaplothrips emineus Ananthakrishnan & Jagadish, 1971 : 264. Holotype ♀, India: Tirupathi, dry twigs, 16.vii.1969 (*TNA*) (LCM). [1 ♀, 1 ♂ ?paratypes examined].

Bicoloured species; head, lateral margins of pterothorax, anterior margin of abdominal segment II and tube brown; abdominal tergites III–VIII yellow with median transverse patches near anterior margins; abdominal tergite IX yellow-brown; antennae except segment III brown; segment III yellow.

Antennal segments III and IV with 1 + 2 and 2 + 2 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 4–6 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

Neither of the specimens examined for the present study are labelled as type-material although they bear identical data to some of the paratypes. This species was originally described from five females and three males collected at Tirupathi, Courtallam, and Aryankavu on dry twigs. I have examined a specimen in the USNM from Tirupathi identified as *tener* which I cannot distinguish from *debilis*.

Specimens studied.

?Paratypes 1 ♀, 1 ♂, India: Aryankavu, Tenmalai (Kerala), dry twigs, 12. xi.1969 (*TNA*) (LCM).

Xylaplothrips flavitibia Ananthakrishnan & Jagadish

(Text-fig. 62)

Xylaplothrips flavitibia Ananthakrishnan & Jagadish, 1969 : 128–129. LECTOTYPE ♀, India: Courtallam (*TNA*) (LCM), here designated [examined].

Brown species; antennal segment III yellow, segments IV–VI yellow in basal two-thirds, tinged with brown in apical third, remaining segments brown; fore femora brown with yellow apex; mid and hind femora brown; all tibiae and tarsi yellow.

Antennal segments III and IV with 1 + 2 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and expanded apically; macropterous, fore wings with 4–8 duplicated cilia; median setae (B_1) on abdominal tergite IX very slightly expanded.

Ananthakrishnan & Jagadish (1969) described *flavitibia* from three females and four males from Courtallam and Pachmarhi but did not designate any of these specimens as the holotype. The female and male syntypes from Courtallam I have examined are labelled 'HOLOTYPE' and 'ALLOTYPE' respectively. The female labelled 'HOLOTYPE' is here designated as the lectotype. The two specimens I have examined from Pachmarhi have identical data to some of the syntypes but are not labelled as type-material.

Specimens studied.

Lectotype ♀, India: Courtallam, wild galls, 20.vii.1963 (*TNA*) (LCM). ?Paralectotypes 1 ♀, 1 ♂, India: Pachmarhi, wild galls, 21.xi.1966 (*TNA*) (USNM).

India: Allahabad, 2 ♀ galling *Acacia leucophloeae* Wildenow, reared 1.xii.1966 (*B. D. Agarwal*) (USNM).

Xylaplothrips flavus Ananthakrishnan

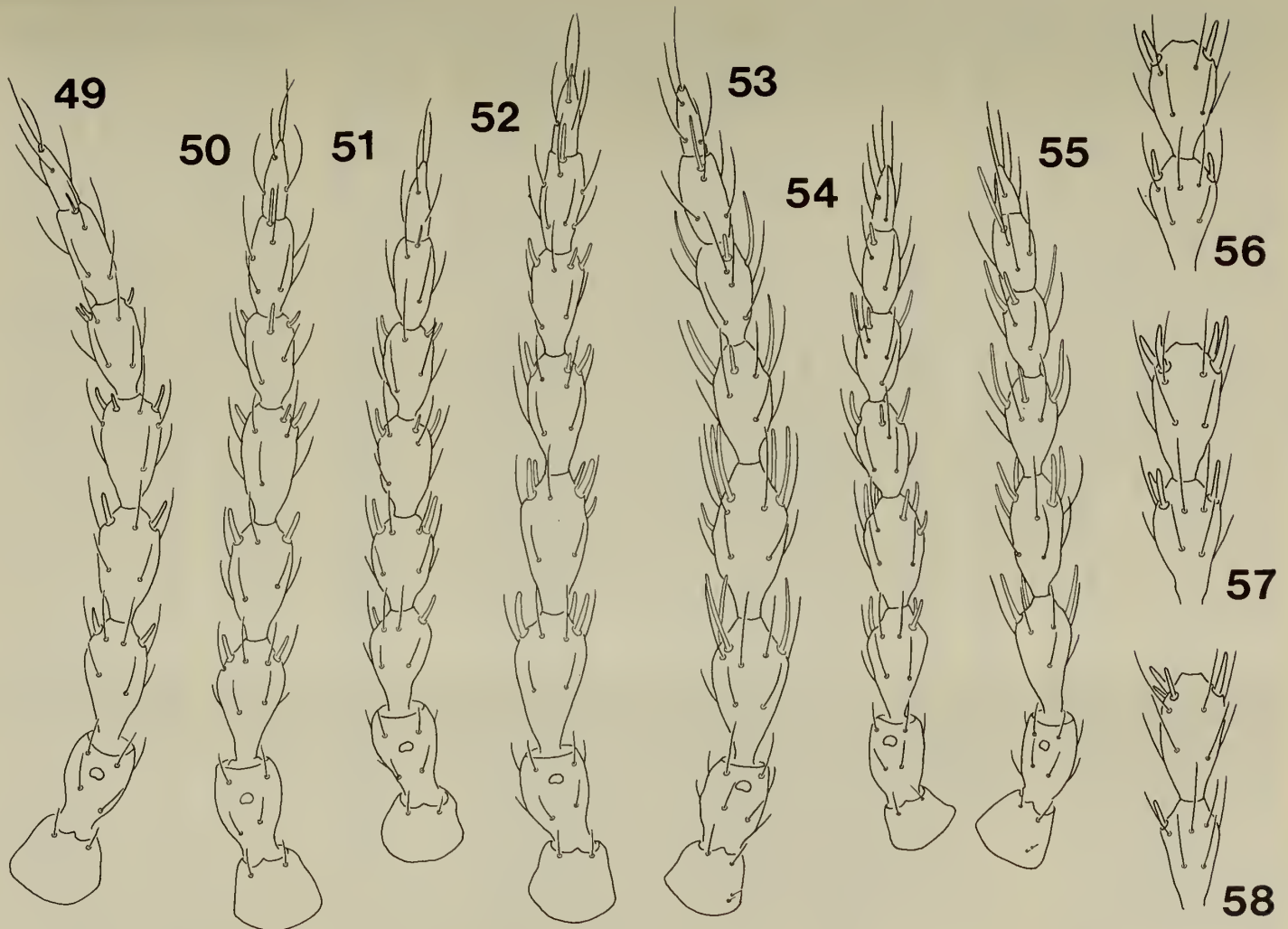
(Text-fig. 54)

Xylaplothrips flavus Ananthakrishnan, 1964*a* : 51–52. Syntypes 2 ♀, 4 ♀, India: Sirumalai Hills (LCM) [1 ♀ examined].

Brown species; antennal segment III yellow, segments IV and V yellow at base, pale brown at apex, segment VI pale brown, yellow at extreme base; all femora brown, yellow brown at apex; all tibiae yellow tinged with brown medially; all tarsi yellow.

Antennal segments III and IV with 1 + 2 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 4–5 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

This species was originally described from two females and four males collected at Sirumalai Hills in palm inflorescences. None of these specimens was designated as the holotype although the single female syntype examined is labelled 'Paratype'.



FIGS 49–58. Antennae of *Praepodothrips* and *Xylaplothrips* species. 49, *P. indicus*, paratype ♀. 50, *P. cymbapogoni*, ♀. 51, *P. nigrocephalus*, holotype ♀. 52, *P. priesneri*, holotype ♀. 53, *X. inquilinus*, lectotype ♀. 54, *X. flavus*, syntype ♀. 55, *X. emineus*, ♀. 56, *X. debilis*, holotype ♀, segments III and IV. 57, *X. pusillus* (paratype ♀ of *debilis*), segments III and IV. 58, *X. ligs*, holotype ♀, segments III and IV.

The only other specimen I have examined has identical data but is not labelled as a type.

Specimens studied.

Syntype ♀, ?syntype ♂, India: S. Sirumalai Hills, inflorescence of wild palm, 1959 (*TNA*) (LCM).

Xylaplothrips inquilinus (Priesner) **comb. n.**

(Text-fig. 59)

Haplothrips inquilinus Priesner, 1921 : 4. LECTOTYPE ♀, Java: Semarang (SMF), here designated [examined].

Xylaplothrips inquilinus Ananthakrishnan, 1966 : 13. Syntypes 9 ♀, 3 ♂, India: Perintalmanna (Kerala); Alargarkoil (Madura); and Araku Valley (Andrha) (LCM) [2 ♀ ?syntypes examined]. **Syn. n.**

Xylaplothrips longus Ananthakrishnan & Jagadish), 1969 : 129. LECTOTYPE ♀, India: Tirupathi, here designated (LCM) [examined]. **Syn. n.**

Xylaplothrips orientalis Ananthakrishnan & Jagadish, 1969 : 129. Syntypes 4 ♀, 3 ♂, India: Tirupathi; Tambaram (LCM) [not examined]. **Syn. n.**

Brown species; antennal segments III–VI usually yellow in basal half, pale brown in distal half, rarely almost completely yellow; segments I–II, VII–VIII brown; mid and hind femora brown; mid tibiae yellow at base and in apical half; hind tibiae yellow at base and apex.

Antennal segments III and IV with 1 + 2 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae well developed; macropterous, fore wings with 5–8 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed or blunt.

Priesner (1921) described *inquilinus* from two females and four males collected at Semarang, Java in galls on *Ficus benjamina* L., 9.iii.1912 and *Smilax* sp., 5.i.1912 (*Docters v. Leeuwen*). I have examined all of these specimens which are mounted on two slides. One male and one female are mounted on a single slide with a specimen of '*Andothrips melastomae*'. This female is here designated as the lectotype.

I have examined females of '*inquilinus* Anan. sp. n./T. N. ANANTHAKRISHNAN' from Alargarkoil and Perintalmanna which bear identical data to some of the syntypes of *inquilinus* Ananthakrishnan. Although these are not labelled as such, I suspect they are syntypes.

Xylaplothrips longus was described from two females collected at Tirupathi. Neither of these specimens was designated as the holotype although the female syntype examined is labelled 'HOLOTYPE'. This female is here designated as the lectotype.

The above synonymies are based on examination of the lectotype and paralectotypes of *inquilinus* Priesner, two ? syntypes of *inquilinus* Ananthakrishnan, the lectotype of *longus* and a specimen of *orientalis* identified by Professor Ananthakrishnan. In addition to this material I have seen a female of *inquilinus* Ananthakrishnan identified by Professor Ananthakrishnan. This specimen has identical data to the lectotype and paralectotype of *longus* and the female and male syntypes of *orientalis* from Tirupathi.

SPECIMENS STUDIED.

Lectotype ♀, paralectotype ♂ of *inquilinus* Priesner, JAVA: Semarang, 'in Gallen auf *Ficus benjamina* L.', 9.iii.1912 (*Docters v. Leeuwen*) (SMF); paralectotypes 3 ♀, 1 ♂ of *inquilinus* Priesner, JAVA: Semarang, 'in Ballgallen auf *Smilax* spec.' 5.i.1912 (*Docters v. Leeuwen*) (SMF). Lectotype ♀ of *longus*, INDIA: Tirupathi, *Pavetta* sp. 10.viii.1965 (*TNA*) (LCM).

?Syntypes 2 ♀ of *inquilinus* Ananthakrishnan, INDIA: 1 ♀ Perintalmanna, *Pavetta* galls with *Teucho. longus*, 5.xi.1963 (*TNA*) (LCM); 1 ♀ Alagarkoil, *Pavetta* galls with *Teucho*, 10.ix.1964 (*TNA*) (USNM).

INDIA: Tirupathi, 1 ♀ on *Pavetta* sp. galls, 10.viii.1965 (*TNA*) (LCM).

Xylaplothrips ligs Ananthakrishnan & Jagadish

(Text-fig. 58)

Xylaplothrips ligs Ananthakrishnan & Jagadish, 1971 : 261–263. Holotype ♀, INDIA: Tirumalai, Tirupathi (LCM) [examined].

Brown species; tarsi paler; antennal segment III yellow with yellowish brown apex.

Antennal segments III and IV with 0 + 1 and 1 + 2 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 5–6 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.

I have examined the holotype female and allotype male of *ligs* and a second female with identical data to the paratype female. The male differs from both the females in having 1 + 1 sense cones on each of antennal segments III and IV as in *debilis*. I have suggested above that *debilis* may be an aberrant form of *pusillus* and it is possible that *ligs* is likewise an aberrant form. I have examined material of *pusillus* and *debilis* with identical data and material of *pusillus* and *ligs* with identical data.

SPECIMENS STUDIED.

Holotype ♀, INDIA: Tirumalai, Tirupathi, on dry twigs, 19.vii.1969 (*TNA*) (LCM). INDIA: Tirumalai, Tirupathi, 1 ♀ on dry twigs, 31.vii.1969 (*TNA*) (USNM).

Xylaplothrips micans Ananthakrishnan & Jagadish

Xylaplothrips micans Ananthakrishnan & Jagadish, 1971 : 265–266. Holotype ♀, INDIA: Aryankavu (LCM) [examined].

Mainly yellow species; apex of head, mesothorax, posterior portion of pelta and anterior half of abdominal segment II and tube brown; antennal segments I–III yellow, remaining segments yellow; all legs yellow.

Antennal segments III and IV with 1 + 1 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal setae vestigial, mid-lateral setae well developed and expanded apically; macropterous or apterous; fore wings when fully developed with 6–7 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

Ananthakrishnan & Jagadish (1971) described *micans* from a total of three

females and three males collected on dry and decaying twigs and bark at Aryankavu, Kodaikanal and Madras. The original description refers only to macropterous females and males. Although the holotype female is macropterous, the female paratype that I have examined is apparently apterous.

Specimens studied.

Holotype ♀ macroptera, India: Aryankavu, dry twigs, 12.xi.1969 (*TNA*) (LCM); paratype ♀ aptera, Kodaikanal, *Lantana* twigs, 31.xii.1968 (*TNA*) (LCM).

Xylaplothrips pictipes (Bagnall)

(Text-fig. 61)

Haplothrips pictipes Bagnall, 1919 : 273–274. Lectotype ♀, India: Talimparamta Malabar (BMNH), designated by Mound (1968 : 139) [examined].
Neoheegeria pictipes (Bagnall) Mound, 1968 : 139.
Xylaplothrips pictipes (Bagnall) Ananthakrishnan, 1969 : 122.

Brown species; intermediate antennal segments paler; apex of fore femora yellow, tinged with brown medially, yellow at base; tarsi yellow.

Antennal segments III and IV with 1 + 2 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 5–7 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed or blunt.

The two female specimens in the USNM that I have examined had been misidentified as '*Xylaplothrips mimus* Pr.' This species differs from *pictipes* in having 1 + 1 and 1 + 2 sense cones on antennal segments III and IV respectively.

Specimens studied.

Lectotype ♀, paralectotypes 2 ♀, India: Malabar, on diseased pepper berries, ix.1918 (*Ramakrishna*) (BMNH).

India: Hubli, 2 ♀ on grass, 17.xi.1964 (*TNA*) (USNM).

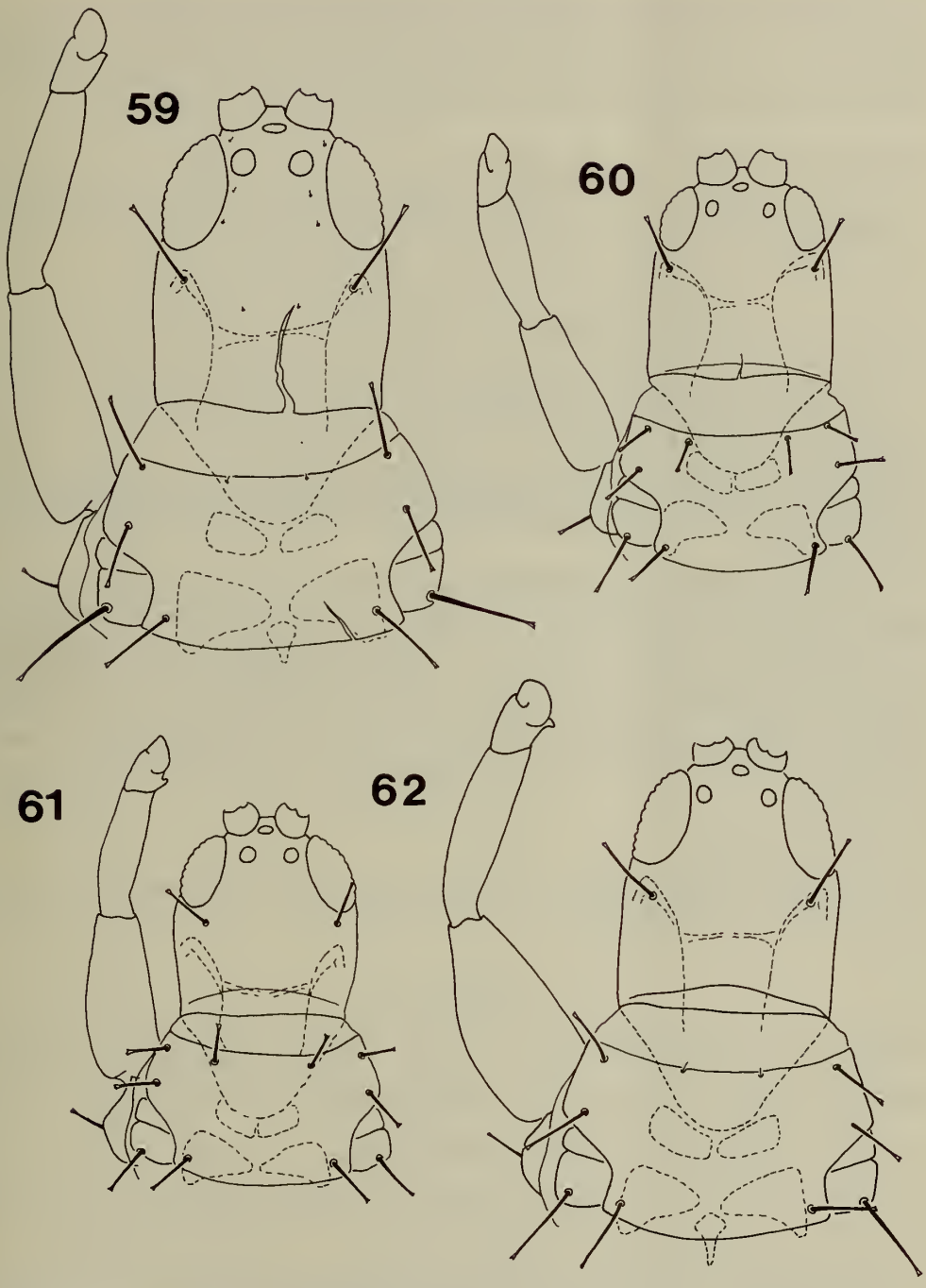
Xylaplothrips pusillus Ananthakrishnan & Jagadish

(Text-fig. 57)

Xylaplothrips pusillus Ananthakrishnan & Jagadish, 1969 : 125–126. Syntypes 1 ♀, 1 ♂, India: Kulatupuzha (LCM) [not examined].

Yellow-brown species; head, thorax and tube brown; abdominal segments II–IX yellow-brown, segments II–VIII with a brown median transverse patch, segment IX darker posteriorly; antennal segment I brown, segments II and III yellow brown, segment III with extreme apex brown, segments IV–VIII brown, darker than head; femora brownish yellow; all tibiae and tarsi yellow.

Antennal segments III and IV with 1 + 2 and 2 + 2 sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae well developed and expanded apically; macropterous, fore wings with 4–5 duplicated cilia; median setae (B_1) on abdominal tergite IX pointed.



FIGS 59–62. *Xylaplothrips* species: heads, pronota and left forelegs. 59, *inquilinus*, ♀. 60, *pusillus*, ♀. 61, *pictipes*, ♀. 62, *flavitibia*, ♀.

The above morphological diagnosis is based on a single female from Tirupathi identified by Professor Ananthakrishnan as *pusillus*. I am unable to distinguish this from the paratype females of *debilis* from Aryankavu that I have examined. As stated above I suspect that both *debilis* and *ligs* are forms of *pusillus*.

Specimens studied.

India: Tirupathi, 1 ♀ on dry *Smilax* twigs, 21.vi.1970 (*TNA*) (LCM); paratype ♀ of *debilis*, Aryankavu, on dry twigs, 12.vi.1968 (*TNA*) (LCM).

Xylaplothrips tener Ananthakrishnan & Jagadish

Xylaplothrips tener Ananthakrishnan, 1969 : 126–128. LECTOTYPE ♀, India: Goa-Londa Border (LCM), here designated [examined].

Brown species; antennal segment III yellow in basal half, brownish yellow in apical half; tibiae yellow sometimes tinged with brown medially; all tarsi yellow.

Antennal segments III and IV with 1 + 2 and 2 + 2^{+1} sense cones respectively; post-ocular setae expanded apically; pronotal antero-marginal and mid-lateral setae expanded apically; macropterous, fore wings with 4–6 duplicated cilia; median setae (B_1) on abdominal tergite IX expanded apically.

Ananthakrishnan & Jagadish (1969) described *tener* from two females and two males collected at Goa-Londa Border but did not designate any of these specimens as the holotype. I have examined a syntype female labelled 'HOLOTYPE' which is here designated as the lectotype. I have also examined a male specimen labelled 'ALLOTYPE' but this is apparently from 'Kulatupuzha, on *Areca* sheath, 25.i.1967 (TNA)'. These data, however, have been crossed out. The only other specimen identified by Professor Ananthakrishnan as *tener* that I have seen is in fact *debilis*.

Specimens studied.

Lectotype ♀, India: Goa-Londa Border, 12.x.1965 (*TNA*) (LCM); paralectotype ♂, ? collected with lectotype.

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INDEX

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